RAILROAD GAZETTE

FRIDAY, NOVEMBER 13.

Steel Tires vs. Chilled Wheels.

The regular monthly meeting of the New England Railroad Club was held on Oct. 28, at the rooms in the Boston & Albany passenger station, Boston, the President, Mr. J. W. Marden (Fitchburg), in the chair. There were present some 80 gentlemen, including many prominent railroad men.

The PRESIDENT: The questions for discussion to-night are:

"Is it economy to grind chilled wheels?"

"Is it economy to use steel-tired wheels for passenger service?"

These subjects are those in which we are all interested, and undoubtedly all of us will be glad to hear the opinions and experiences of each other. Mr. Henry A. Little, representing the English steel wheel, will read a letter from Mr. W. R. Ellis, of New York, on this subject.

Mr. LITTLE then read as follows:

"A friend of mine recently went from Boston to Chicago, and had to change cars at a way station because two of the wheels under his sleeper had broken. There was no accident, but there 'might have been.' The other day I read of a servant girl who dropped a kerosene lamp; it did not explode, because it was not lighted and there was no kerosene in it at the time. But the accident furnished an argument against the use of kerosene lamps, and similarly an argument can be deduced from the above broken wheels. A gentleman from Australia told me a few days ago that a large proportion of the horses in that country went barefoot the year round, and others were shod only on the hind feet, and yet I imagine that in the paved city of Melbourne they are not discussing the question of the economy of shoeing their horses.

"This question has passed the stage of general discussion, and some of the railroads of this country have arrived at a point when they can be compared to the paved streets of a city on which unshod horses can only be used with great care and certainly not with economy. Other railroads can continue to discuss this broad subject, and can decide according to their special conditions.

"I note one great change during the four years I have made a study of the steel-tired wheel question. Many railroad men have now made up their minds that on their lines they must have steel-tired wheels under their passenger coaches at least.

"The subject has reached this stage: on certain lines steel-tired wheels must be used; on others it is still a question as to comparative economy. But those railroad men who have decided that they must have steel-tired wheels are sometimes inclined to reconsider their decision, for they find themselves frequently face to face with the same old questions in another form. First and foremost, they decide to use steel-tired wheels, because they must have absolute safety, and while experimenting with various patterns they have found that the two things do not necessarily go together, but a little reflection, after the feeling of disappointment at the failure of an apparently safe wheel has worn off, will show them that absolute safety in a steel-tired wheel is attainable, as is proved by the records in both this and other countries.

"Then again they are gradually brought face to face with the cost of keeping steel-tired wheels in order; repairing them, re-turning them, etc., and while they had made up their minds to pay an immense price for steel-tired wheels, and had accepted the fact as the difference between the first cost of a steel-tired and of a cast-iron wheel, they had supposed that the matter ended there, and are surprised to find they have to pay almost the first cost over again. But even then let them stick to their first decision and study the different steel-tired wheels and ascertain from the records which is really the most economical."

The PRESIDENT: Which kind of tire will give the best service, [crucible or open hearth? Can the difficulties of turning up steel-tired wheels be diminished? In order to secure economy in the use of steel-tired wheels a uniform system of dogging the steel-tired wheels in the lathe is necessary. We must either cast a hole in the plate for the bolt, or adopt some device whereby the dog will permit the wheel to be ground or turned in the lathe.

Mr. LITTLE: A wheel with wrought-iron spokes needs no hole drilling in the plate.

Mr. ADAMS: My views on steel-tired wheels are well known, and I came here to learn something about grinding wheels.

Mr. BARNES (Allen Paper Car Wheel Co.): We have adopted a device for dogging a car wheel when turning it in the lathe. The device or driver is simply a round piece of cast-iron about 11 in. long and 5½ in. dia. on top and 6½ in. dia. on base with a flange 13¼ in. dia. and 1¼ in. thick. This driver is secured to the face plate of the lathe with three 1 in. bolts, and is bored out to receive a mandril 2½ in. dia., which is held in the driver with a set screw. A clamp is placed over the mandril with a 1 in. square key, one end resting on the end of the driver, and the other end clasping a bolthead in the wheel. By tightening the set screw in the clamp, the mandril and key acts like a vise, and the wheel can be made fast in the lathe without removing any of the bolts.

Mr. GRIGGS (Providence & Worcester): We have about 400 steel wheels on our road. They are doing good service, and have proved economical, giving very little trouble from failures and none in turning even the Allston wheel, which is the hardest to turn. We have been using the steel wheel over nine years, and the Allston wheel three years, and the latter has never given any trouble whatever. The flanges stand well though our road is full of curves, calculated to give the steel wheel a very severe test. They are turned with great care in a Sellers' double-headed lathe. We use a gauge that shows the distance from the flange to the centre of the journal, and from the inside of the flange to the centre of the axle, and use this gauge to true up the flanges. The tire does not exactly conform to the Master Car-Builders' standard. We are well satisfied with the economy of steel-tired wheels over cast-iron wheels. We have not taken out a pair of wheels in two years on account of flat spots, which are due mainly to bad adjustment of the air brake. We allow 60 to 70 pounds pressure, and arrange the leverage to suit.

Mr. BARNES: One of the principal objections made in equipping new roads with paper wheels has been the seeming additional cost, but if we take into consideration the additional amount of investment necessary to locate at points along the line of road a stock of iron wheels and axles sufficient to maintain cars properly, the investment will show in favor of the paper wheel. Take, for instance, the Erie Palace Car Line, of some 40 cars, for which it is necessary to carry an average stock of from 600 to 650 new and old wheels at 15 points along the line; say 625 wheels at $10 each, and 425 axles at $10 each, the total value of which is $10,500. Were those cars all equipped with paper wheels they would have to carry a stock at one end of line only, and 45 pairs of paper wheels on axles and 20 extra axles would cover all the stock necessary for renewals. We could reduce the permanent investment to about $7,500 for stock, against $10,500 necessary for an iron wheel equipment, not taking into consideration the greatly reduced cost of fitting, handling and freight.

A fair calculation of cost of service in wheels can be better reached by including cost of axles used in connection with them. The life or service of the axle can be materially increased by the use of paper wheels, and the wheel should have the credit. A large number of our leading roads condemn axles (iron or steel) used in iron wheels under passenger equipment at 100,000 miles service. An axle will run indefinitely in a paper wheel without crystallization or disintegration of metal, and its service is only limited by the wear at the journal. The Hotel Car Line between New York and Chicago has been running since 1876 upon paper wheels, and a service of between 500,000 and 600,000 miles has already been maintained, during which time only some half dozen axles have been removed, and these because the journals were worn below the minimum allowed. Two of these, at 282,000 and 312,000 miles respectively, were tested by Mr. T. N. Ely, Supt. of Motive Power, Pennsylvania Railroad, at their Altoona shops. On the Chicago & Alton and the Chicago & Rock Island they have a few of our wheels in use. Twelve wheels average 358,890 miles each; highest, 498,790 miles. Another lot of 16 wheels average 383,792 miles; highest, 623,368 miles. On the Chicago & Rock Island road, twelve 33-in. wheels, put in service in 1878, average 362,000 miles, with no change of axles. I cannot say whether the sixteen wheels that have an average on the Chicago & Alton line of 623,000 and odd miles were worn out or not.

Mr. ADAMS: They are probably worn out, as the average is not usually over 400,000 miles.

Mr. BARNES: We have wheels on the Pennsylvania that have made an average of over 400,000 miles and are still running. We get the average on a lot of wheels that are still running by taking the wheels from the time they are put on, and take the average when they make up their mileage.

Mr. ADAMS: We do not take the mileage until the wheel is worn out. It is not fair to give the average of a wheel when it has yet more service to perform.

Mr. BARNES: It is rather against us than in our favor, as we do not know how much more mileage one of these wheels can make. Eight wheels on the Pennsylvania average 521,317 miles, and 6 are still in service; 74 wheels average 444,454 miles, and 68 of them are still in service; 306 wheels on the same road average 330,577 miles, and 271 of them are still in service, and the 70 wheels taken out of the lot of 288, for turning up the tires, had made 166,113 miles before the first turning.

Mr. LAUDER (Old Colony): If the average mileage is 300,000 miles, and the maximum over 600,000 miles, some wheels may have made only 100,000 miles, or even 25,000 miles. The wear of wheels of all sizes is very uneven, and that is something we want to avoid. A set of wheels running several months under a car will wear the flange, because one tire wears faster than the other, possibly because one wheel is softer than the other. The wheel with thin flanges must be taken out and re-turned. My experience with steel-tired wheels has not been very encouraging. I find on a dead straight road that wheels will go to flange worse than on a crooked road, especially on steel-tired wheels, when one tire is worn a trifle smaller. Steel-tired wheels on a straight line will inevitably crowd the flange on to the rail. On a curved road the wheel is first on one curve, and then on the other, and that equalizes things. The division of the Old Colony road running to Provincetown runs round like a circle, and the wheels under the cars inevitably flange on one side. Turning the cars around would equalize the wear of the wheels. But even then steel-tired wheels will wear much more rapidly than chilled wheels. There is no wheel yet produced so safe or economical for railroads to use as a good chilled wheel, unless you go above 33 in., and if we could get a chilled wheel 42 in. that would be better still. The chilled wheel has a bad reputation for breakage, because roads will persist in buying wheels that are not fit to run, and manufacturers will persist in making them. Wheels made by good makers, such as Hart, Thacher, Ford & Kimball, Lobdell, or Nye, do not break, because every wheel they make is carefully inspected before it leaves the works, and every wheel that is cracked or has the slightest imperfection is thrown out. The very fact that steel-tired wheels have rings around them or appliances of some sort to prevent them from doing damage if they do break, shows that the manufacturers expect them to break; at least, if they were perfectly safe the manufacturers would not have put on these appliances to prevent trouble in case they break. I hope that our steel-tired manufacturers, who are here in force to-night, will give us all the information they can on this question.

Mr. SNOW (Ramapo Wheel Co.): We commenced making 42-in. wheels as early as 1874, and have made a great many thousands since then. I know of no 42-in. broken wheels of any kind, but the 33-in. wheel runs 27 per cent. faster than the 42-in., which makes a great difference in the hammering on the wheel and the rail, and consequently there is less liability to break. But I think the 42-in. wheel is just as safe as the 33-in. under the same equipment.

Mr. GRIGGS: The present method of hanging brakes wears the flanges. The brakes under our cars are so arranged that we connect the lower brake rod so as to get as near a direct pull on the brake as possible, in order to keep the edge of the brake-shoes from pressing against the flange of the wheel. This saves the flanges and takes off some of the end wear of the brake, as well as the shoulders of the journals. The flanges of chilled wheels wear just as much, if not more, than steel wheels.

Mr. LAUDER: If two chilled wheels, both of the same diameter, are put on the axle, even if one does wear a little faster than the other, they do not wear so rapidly on the flanges as the steel-tired wheels, because the chill on cast iron extends up on to the flange where the metal is hard, which is not the case in a steel wheel. While the abrasion on the rail would be the same, the effect would not be the same on the wheel. I do not mean to say that it would take vastly more abrasion on the flange of the chill metal to make it sharp or to cut it down to make it unsafe. While the brake has a great deal to do with the wearing of the face of the wheel, it would have a worse effect on the steel flange than on the chilled flange. Our cars, which we have to trust to men to whom we pay from $1.50 to $2 a day, are scattered all over New England, and lots of these cars never get into the shop until they are brought in for repairs.

Mr. LITTLE: Does Mr. Lauder find the same trouble on locomotive drivers wearing to flange as he does on car-wheels?

Mr. LAUDER: If the locomotive is put up square it will show very little flange wear. If the car trucks were put up with the same care and exactness as our engines the flanges would give no trouble on freight cars. Cases of flanges cutting are due to mechanical defects in the truck; the wheels are not in their proper places, and the general construction of the truck is not accurate. The holes are drilled a little outside of the central line, and the castings are put in rough without planing or fitting of any kind. The journal is from $\frac{1}{16}$ in. to $\frac{1}{8}$ in. out of the proper position, and wherever the wheel and axle is too much one way, the wheel which is farthest away from the centre of the axle will inevitably flange. If the steel tires on a locomotive are not uniform, I do not see why it would not affect the engine as well as the wheels under the cars, especially where they slip so much as they do. The wear of the wheel is in the tire, so far as mileage is concerned, and if all the wheels could be equipped with one standard tire and run for a length of time, we could get at a more accurate calculation as to what the wheel is really worth. The economy in the use of steel-tired wheels is in the first cost, and if we can use the centre of the wheel after the tire is worn out and could re-tire it, and get a still further big mileage out of it, the whole question then comes down to the tire. The flanges of driving tires do not cut, possibly because they have nothing to do with guiding the engine, which is done by the front truck. In backing an ordinary eight-wheel engine, the drivers have to guide the engine, and the driver-wheel flanges soon wear.

Mr. ADAMS: Chilled wheels wear on the flange as fast as steel-tired wheels, and a curved road will wear the tires or flanges faster than a straight road. On our Ware River Division, which is very crooked, the flanges wear three times as fast as on the main line. The wear of the flange depends a great deal on the manner in which the truck is constructed, and the application of the brakes. The truck being a little out of square has more to do with the wearing of the flange than anything else. If anybody will carefully observe the wheels that have worn to flange they will find that either one wheel is softer than the other, or one is set up nearer the shoulder than the other. Nine-tenths of the wheels under cars vary from $\frac{1}{16}$ in. to $\frac{1}{8}$ in. between the shoulders and the axles, which will make a difference in the wear of the flanges. If there was as much care taken in the construction of the running gear under our passenger cars as there is in the construction of engines, we would find a decided difference in the wear of steel-tired wheels. Most steel-tired wheels are not absolutely safe or indestructible, for though the paper wheels are said to be indestructible several have broken, and done some damage. Nevertheless, I believe they are much more economical for passenger service than cast-iron wheels. Our records prove it beyond all possible dispute, and our officers are fully convinced of that fact, and wish to continue their use. We keep a very careful record of our mileage, and we know the mileage every wheel makes. The mileage of our wheels under passenger equipment is taken from the time they are put under until they are absolutely used up, and we make a report on them from year to year. The mileage of every wheel is given when the wheel is destroyed, or when its usefulness has ended for passenger service. Last year we had 103 wheels that were used up for passenger service, and the average of these wheels was 284,000 miles. They were the Washburn 33 in. wheel. Forty-three of these wheels were put under freight service, and I expect they will make better mileage than any cast-iron wheel made. With these facts before us, we conclude that the steel wheel is the cheapest wheel. If more care was taken in buying first-class wheels, we would probably get better results, as a majority of the cast-iron wheels that are broken are undoubedly cheap wheels. Crucible steel tires are the cheapest, although we have a good many wheels running with open hearth steel tires. Wheels will wear rapidly if one wheel happens to be softer than the other. If we find a soft wheel on one end of the axle and a hard one on the other end, we take them off and put them on with wheels of equal density, putting two soft wheels together and two hard wheels together, and they do much better. Many who use cast-iron wheels do not understand how to use them economically, and do not get as much wear out of them as they would with a little more care.

Mr. LITTLE read a communication from a well-known railroad man, for obvious reasons withholding his name:

"The wrought iron steel-tired wheel which failed under the Pullman coach on this railway, was not made by the Patent Shaft and Axletree Co., and, I may say, without excepting one wheel out of some 1,200 of 33 in. dia., purchased by this company in 1872, there has not been one accident in which your wheels have been involved in any way; and in justice to the maker of the wheel which recently failed under the Pullman coach, I am informed that the failure was not due to any particular construction of the wheel.

"The recorded mileage of your wheels with open hearth tire is 524,261 miles up to Jan. 1, 1885, and they are still going."

Mr. R. W. ALLISON (Allentown, Pa): We manufacture machines for grinding steel-tired wheels under the patents owned and controlled by the Car Wheel Grinding Co. of Carson, Nevada, which are used on the Virginia & Truckee Railway, which runs from Reno to Virginia City, and has some very heavy grades and sharp curves. They were using chilled iron wheels entirely, and found they were wearing out so very fast that they were compelled to do something to save their wheels, which out there cost them about three times as much as they do here. Mr. H. M. Yerrington, the Superintendent of the railroad, concluded that if the flat spots were taken out of the wheels he could get more mileage out of them. He began first on an ordinary lathe and undertook to grind them with emery wheels, and step by step they got up a machine, which they have asked us to build. About two years ago the Master Car-Builders took the matter in hand and made a report on the subject which, I suppose, you have all seen. About the time we had put a machine on the road mentioned for grinding chilled wheels, they were glad to go a step further and adopt the machine for turning steel-tired wheels also. As the machine is now built, it will grind the chilled wheels and turn the steel-tired wheels. The emery wheel used will take out flat spots in steel-tired wheels that are too hard to turn.

Mr. A. B. Pullman, Vice-President of Pullman's Palace Car Co., writes:

"We have in several instances trued up old wheels, and put them back into service with very good results; whereas, before the introduction of the grinding machine, we would have to consign them to the scrap heap. The following shows the mileage of the first pair of old wheels treated by us on this machine:

CHICAGO WHEELS.

		Mileage each.
8,835—8,808, applied for	Castalia	85,613
7,057—7,071, "	" Sarnia	147,160
8,091—8,101, "	" Scythia	105,140
8,079—8,728, "	" Sarnia	84,373
8,099—8,097, "	" Magnolia	86,646

"The above wheels were old condemned wheels, and were turned up merely as an experiment."

The report of the Master Car-Builders' Association takes up the subject as to whether wheels ought to be ground. It was stated by some of the Master Car-Builders that they have found wheels very much out of truth. Mr. Garey, of the New York Central, says:

"Have been using the grinding machine about six months, and from my experience and observation I think it is not injurious to grind wheels, but my experience has been too short to give positive proof either way. Passenger cars ride decidedly smoother with ground wheels." Mr. J. N. Fording, of the Virginia & Truckee Railway, says that his experience

there with wheels turned up by the grinding process has proved to him that it is the only true method by which a chilled car wheel can be made to run perfectly, and one of great economy to his company. Mr. T. N. Ely (Pennsylvania) writes:

"We do not consider that grinding affects wheels injuriously in any way, provided the chill of the wheel is of sufficient depth to allow the flat spot or irregularity to be trued up without going below the chill. We get the same wear from a ground wheel, provided the chill is of sufficient depth, that we do from a new wheel. The passenger cars ride smoother with ground wheels. We have seen cast wheels as much as ⅛ in. out of round."

Few machines are yet in use, but there is one in Chicago, one on the Lehigh Valley, one on the New York Central, and one on the Pennsylvania.

Mr. PACKARD (New York Central): I was a member of the committee appointed to make the report on this subject before the Master Car-Builders' Convention in Chicago, in June, 1883. We sent a circular to every railroad who had a machine in use, and their report was not very enccuraging for the machine. Nearly every one reported at that time that while there was economy in the use of grinding machines, they did not have the facts to make their information intelligible. Many of them have thrown the machines out of use entirely.

Mr. SNOW: The Pennsylvania has one of the machines in use, and they like it.

Mr. ADAMS: If Mr. Pullman's statement is correct, I think it would be policy for some of the wheel-makers to buy one of these machines and grind up their old wheels and get more work out of them than when they were new. (Loud laughter.)

Mr. SNOW: Standing outside of my office I have four wheels that have a record of over 436,000 miles each, and I think if they were re-ground I have no doubt that you could get many more thousand miles out of them.

Mr. ROSS KELLS (formerly of New York & New England): We had one of the machines in use and it gave very good sasisfaction. We ran it two months on old wheels and we did not purchase any new ones, although we ground a few of the new wheels and also a few of the old wheels. We ground about ten pair of wheels a day.

Mr. SNOW: If a wheel has slid in the winter time, it expands very suddenly if it becomes very hot, and contracts about as suddenly as it expands. The result of this peculiar feature is to check the chill in sections in diamond form, and in time the section will fall out, in which event, it will extend to the bottom of the chill or gray iron. When a wheel is spoiled in that manner there is no use in grinding it, because it has gone to the point of the gray iron. But a large majority of the wheels that are spotted are not spotted by sliding, because many wheels under locomotive tenders are spotted that never had the brake applied to them Such wheels, I think, can be ground up very economically. My opinion as regards this spotting, is that there are cases in which the metal when being cast instead of laying perfectly still, moves about on the tread. This causes little air spots around it, and the iron is in commotion, if there is any gas in the sand or the mould, whereby the air is trying to get out. That keeps it in motion and while it would appear sound on being broken up there is a separation there because of this commotion in the molten iron when being poured in the mould. Hollow spoke-wheels will crumble very quickly, and we never guarantee their mileage. When the spokes are made solid from the tread, the gases in the core will get out at the easiest place, or where the iron was most molten. The increased mileage of spoke wheels are very great on that account. Where the iron was perfectly still it will give a great deal more mileage than if there was a commotion.

The PRESIDENT: When we first changed our passenger equipment to the automatic brake, a representative of the Westinghouse people came over here, and every one of our cars was weighed and the leverage was proportioned according to their directions, but soon afterward we were troubled with sliding wheels. Mr. Stewart reduced the pressure from 60 to 40 lbs. per sq. in. when the brakes are fully applied, and wherever we found chilled wheels under cars we have changed the leverage, but with steel tired wheels we are not troubled with slid wheels, except hard, small, flat spots on the tires of open hearth steel. None of the crucible tires have such spots. Crucible steel tires are the most economical for passenger cars, especially on long runs, and probably on short runs. I have visited some shops where they were grinding their wheels. There is probably not one wheel in a thousand that is round, and if wheels were made round before use, we could get more mileage. Wheels are slid owing to their not being round, and the brake-shoe catching on them when the brake is applied. I have recommended our company to buy a machine for grinding chilled-wheels.

We are keeping a record of the mileage of steel-tired wheels. The largest mileage I have obtained on steel-tired wheels before the first turning is 140,000 miles, and I agree with Mr. Adams, that it is not policy nor economy to try to get the largest mileage between the different turnings. The economy in the use of steel-tired wheels is to watch it closely and turn it when it needs turning. We find sharp flanges under the Pullman cars running over our road, especially under six-wheeled trucks, but we have very few sharp flanges under our own cars. Sharp flanges are due to the faulty construction of the trucks and the manner in which the wheels are put on to the axles. The whole running gear of our roads is very crude, and it is not kept up to the standard consistent with economical management.

Mr. COLEMAN: The more accurate our work the better results we get, and the difficulties of the car wheel are like the difficulties of cotton machinery. There are all sorts of appliances to make the spindle run true in bearings of cotton machinery, and the manufacturers pay $33,000 royalties every year for the use of the patents on cotton spindles alone. The spindles are made so light and accurate that they will not wear out, and in order to have a perfectly round spindle in a perfectly round hole, with just space enough for the oil, with a frame that will turn and twist, there must be all sorts of appliances to prevent friction and the cramping of the spindle. If we could make a metal truck that would run and remain perfectly true, with the two axles constantly in line with each other, we would see a different state of things than what we see now. Mr. Corliss, in experimenting with chilled iron for burglar proof safes, found when he began his experiments that no useful data about chilling iron could be had. But he continued his experiments, and he is now able to chill iron from three to five inches deep, and I think his knowledge on the subject of chilling iron is superior to that of any other man in this country. If observations were kept as closely as they will be some day, we would find that the amount of power an engine has to exert in overcoming the resistance due to bad wheels is considerable. A wheel 33 in. dia. ⅛ in. out of truth, is virtually a cam. A passenger car weighs about 24 tons, or 3 tons to a wheel, and every time that wheel goes around it must raise three tons ⅛ in., and in going a mile, you raise 24 tons 6 ft. high in one minute. When applied to a train of cars this becomes a serious question, and the necessity for accuracy is obvious. The easiest way to get wheels true is to grind them, because of the hard flat spots in the metal. We need not make a car as perfectly accurate as a chronometer, but where we make a flexible joint it should be made accurate. I think ten years from now we will see a change for the better in the accuracy of workmanship in a passenger car.

Mr. LITTLE: I move that the discussion on this subject be continued at the next meeting.

The motion of Mr. Little was then agreed to, and the meeting adjourned till 7:30 p. m. on Wednesday, Nov. 18, when a very full attendance is expected.

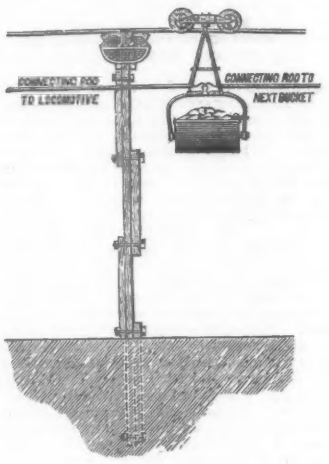


Fig. 1.

TELPHERAGE.

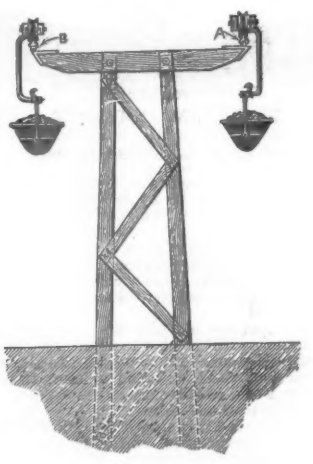


Fig. 2.

Telpherage.

All the English technical journals have recently commented at length, and favorably, on the success of the new system of telpherage or electric haulage, designed for the conveyance of any kind of goods divisible into parcels of a few hundred pounds, at low speeds of 4 to 5 miles per hour. The system is described in *Iron*, to which we are indebted for our engravings, as follows:

The line consists of a double set of steel rods, each 66 ft. long and ¾ in. in diameter, which are carried on wooden supports, 8 ft. apart. The arrangement is clearly seen in figs. 1 and 2 of the engravings, which represent respectively a front and a side view of the supports. The two ends of the line are of angle steel with supports placed 13 feet apart. The buckets, each hold about 2 cwt. A train is made up of ten of these buckets, which are in electrical connection with each other, and with an electric motor in the middle of the train, having five buckets in front of and five behind it. At a point about midway of the length of the line is the engine house, in which is a steam engine which drives the dynamos. From these latter, the current is led to the line, and thus to the electrical motor which moves the train. The motor is started by touching a key, when the train speeds on its way at the rate of between four and five miles an hour. On reaching the siding a laborer dumps each bucket as it passes over a truck. This upsetting, however, will eventually be performed automatically by the ordinary devices. The attendant at the discharging end of the line has full control over the train, and can stop, start and reverse it at will, as can also the man at the pit end. Two trains have been provided on the experimental line; but only one is at present used, that being found sufficient to deliver 150 tons of clay per week, and being actually at work in doing so. The trains need no attention when running, as they are governed to run at the same speed both on rising and falling gradients. An automatic block system is provided, so that as many as 20 trains can be run on the line without the possibility of collision.

The method employed to supply the current to the motor is what is known as the cross-over system, that is, the alternate spans are connected with the positive and negative poles of the dynamo respectively. The same rod carries the train and conveys the electricity, and its electric resistance is very moderate. Extreme constancy in the electric current is quite unnecessary under the actual conditions of working, which in this respect are unlike those of electric lighting. The speed and power are controlled by a centrifugal governor of novel construction. The weights and springs are so combined as to be in unstable equilibrium at the critical speeds. Thus, at say, 2,100 revolutions per minute, the weights will fly out, breaking contact sharply and widely, and they will not return until the speed has fallen to say 1,900. By this plan a permanent arc at the contact is avoided. Injury to the contact pieces is prevented by providing a carbon rod as a secondary contact. This rod is very slowly consumed. By this plan not only is the speed regulated, but the power is distributed in the ratio required by the several motors. While ascending a steep gradient, the current will be on for almost the whole time, and while descending a steep gradient it will be off altogether. On level lines it may be on for, say, a quarter of the whole time of running, being supplied for, say, 2 seconds, and then cut off for 6 seconds. This plan avoids all waste in interposed resistances, and has been tested with good results. The current cut off by each governor is too small to injure the dynamo. The block system referred to can either be arranged automatically or can be worked by hand at termini and sidings.

This latest outcome of electrical science was devised by the late Prof. Fleeming Jenkin, and finally put in practice by Prof. Perry. It is controlled by the Telpherage Company, of 53 Old Broad Street, London. The success of the system from a scientific point of view is stated to be beyond question. Its commercial value is less positively proven.

Cleaning Brass and Plated Car Trimmings.

The following rules and formulæ were presented to the Master Car-Painters' Association at its last convention by Mr. E. L. Fetting, Master Painter of the New York & New England road:

This is an art of great importance, yet one but very imperfectly knows to the masses. One reason for this is that workmen generally keep a very close surveillance over visitors—few, if any, being allowed to enter their workshop or laboratory—and no other class of men are so unwilling to communicate any of the principles or theories of their science. * * Therefore, I take pleasure in introducing to you the above subject for your consideration, with formula for mixing, and blue print showing tanks I use for that purpose.

Material Required.—Sulphuric acid, caustic potash, nitric acid, earthen glazed vessels, earthen glazed pitcher, graduated glass, glass tunnel, cream of tartar, hyposulphate of soda, cyanuret potassa.

Having mentioned the necessary articles, I will proceed with the general instructions.

In tank No. 1 prepare solution of potash, 1 lb. to every gallon of water. In this tank boil off all dirt, oil, varnish or lacquer from work; then in tank No. 2 rinse potash from work in the hot water. The work is now ready for a strong acid. Dip in jar No. 4, which is equal parts sulphuric and nitric acids; this must be mixed at least a day before using and kept in tank No. 3, which contains a weak acid solution, which I will show use for further on; suspend work on brass wire and dip into jar No. 4, then rinse in cold water and dip in jar No. 5, which contains the following solution: 2 oz. cream of tartar in 2 qts. boiling water; then dissolve 1 oz. proto-chloride of tin in 8 oz. of cold water; mix in earthen vessel the above, and heat to boiling: pour off gently the clear solution; then put 6 oz. hyposulphate of soda into 1 pint of rain water; this you now will mix with the above solution, and heat again to boiling; then filter from the separated sulphur; after dipping in jar No. 5, rinse in hot water, and dry off work in sawdust; warm again on some oven and lacquer.

The above solution in jar No. 4 is only for brass work, where ormolu and lacquer have been destroyed. Where the lacquer has not been destroyed, the following method will restore the original lustre; dip them in potash solution for a short time, then rinse in hot water and plunge the work several times in the following solution, which you can use tank No. 3 for: add 1 qt. each of sulphuric and nitric acids to 25 galls. of water; then rinse the work in hot water and dry off in sawdust.

To cleanse silver I use the following solution: 2 oz. of cyanuret of potassa; add 2 qts. rain water; immerse the work in this for two or more hours, as the articles may require; dry the work off with a soft linen cloth, and finish with fine chalk and brush or chamois skin.

American Engines in New Zealand.

The Baldwin Locomotive Works, of Philadelphia, lately furnished some engines for the New Ze aland railways under somewhat peculiar circumstances, which are fully explained below. The accompanying engraving represents the passenger engine. It will be noticed that it is of somewhat peculiar type, being a double-ender Mogul. The freight engine (consolidation type) presents a very similar appearance, a rear driver being substituted for the rear pony wheel.

The subject of American locomotives for the British colonies is particularly interesting at the present time, as another colonial government, that of New South Wales, is now inviting bids for 12 express passenger engines.*

The following is an extract from the official report of the Minister for Public Works for New Zealand, Hon. Edward Richardson, submitted to the New Zealand Parliament, Aug. 25, 1885:

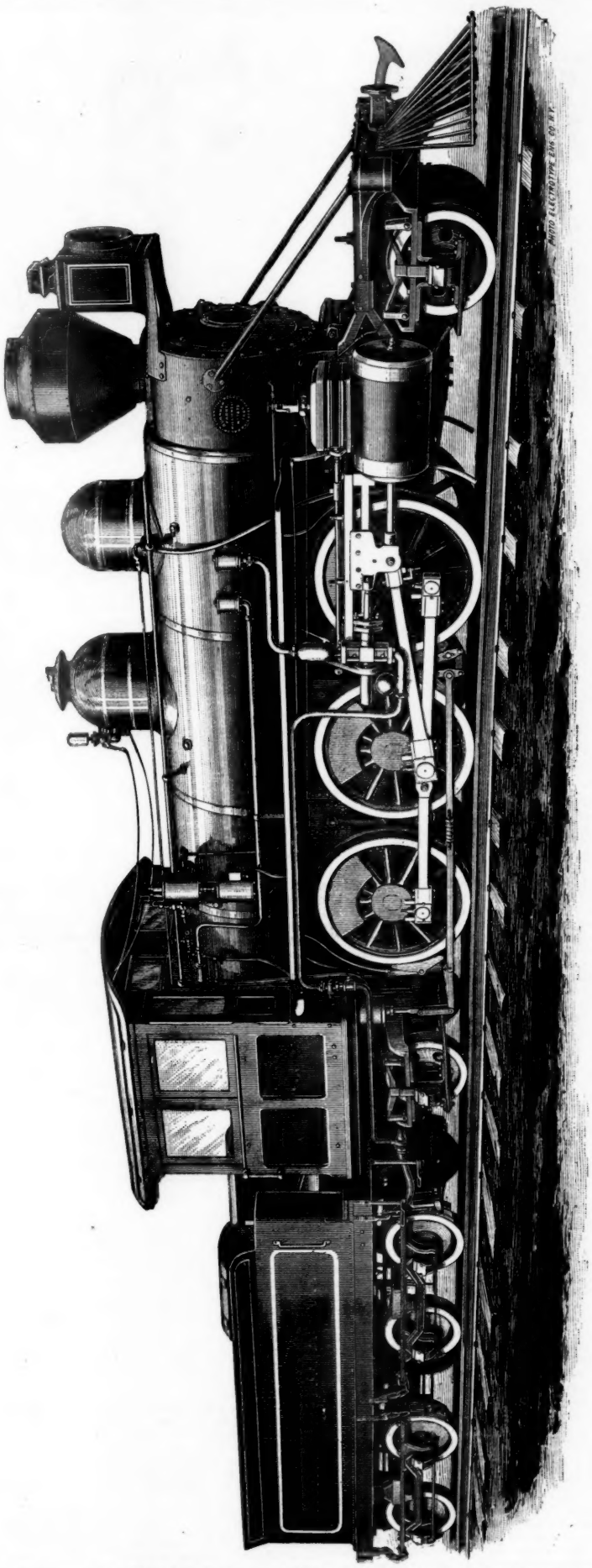
"Twenty locomotives were ordered from England in July and November, 1883, to be delivered for shipment between June, 1884, and March, 1885. In October, 1884, the Agent-General in England cabled me that two of these engines were shipped, but were so heavy that it would be necessary to strengthen all the bridges on the lines they were to run upon: and on inquiring I found that the engines, with tenders, as constructed, were 10 tons heavier than they were specified to be.

"I immediately refused to take these engines, and after a very long and expensive correspondence by cable and letter, the contractors, finding that we would not take the engines built, agreed to alter them in a manner satisfactory to the department, at their own cost. These engines as altered are now coming forward.

"In the meantime, being disappointed in not receiving these engines at the time they were expected, I was obliged to order others, and succeeded in making a contract with the celebrated Baldwin Co., of Philadelphia, to supply 12 engines on the same specification as that sent to England in 1883. The order left New Zealand on Dec. 6, 1884, and we have had advices of the shipment of the whole number at New York by May 1, 1885, namely, within five months from the time of the order leaving here; and a still more satisfactorily part of the business is that they will be delivered for fully £400 per engine less than the English engines."

The locomotives referred to were of two classes, six of them being for passenger service, and having three pairs of driving wheels coupled, with leading and trailing two-wheel trucks, and separate eight-wheel tenders; and six of them for freight service, of the Consolidation pattern, having four pairs of driving wheels coupled, a leading two-wheel truck, and eight-wheel tender. Both classes were for 3 ft. 6 in.

* Drawing and description of an American-built freight engine for this colony will be found in the *Railroad Gazette* of March 27, 1885.



PASSENGER LOCOMOTIVE, NEW ZEALAND RAILWAYS.
Built by the BALDWIN LOCOMOTIVE WORKS, *Philadelphia.*

gauge. It was necessary to design the engines specially to conform to drawings sent with the order. The order was received in Philadelphia Jan. 14, 1885, and the entire 12 locomotives were completed and ready for shipment in April 1885.

The builders, Messrs Burnham, Parry & Williams, of the Baldwin Locomotive Works, write us as follows:

"Early in January we received from the General Manager of New Zealand railways very complete specifications of the engines, accomplished by drawings showing their type, general dimensions and limitation of weight upon each axle of locomotive and tender. At the same time drawings were sent us of essential details, but neither the specifications nor drawings prevented the construction of the engines, in their most important features, in accordance with the American practice. We were asked to telegraph an agreement to conform to the weights and dimensions stipulated, together with our tender for the construction of the engines. In reply we received on Jan. 14 instructions to proceed with the work.

"It was stipulated in the contract that certain given weights on each wheel, and of the engine as a whole, should not be exceeded. These weights were accurately adhered to, and are given below.

"We are not informed of the circumstances of the contract which had previously been made in England, nor of the reasons for the 10 tons weight by which the English locomotives exceeded the limit of weight prescribed."

The following are the leading dimensions of each class of engine:

	Passenger.	Freight.
Cylinders, diameter	15 in.	15 in.
" stroke	20 in.	18 in.
Drivers, diameter	48 in.	30 in.
Tractive power, per lb. average pressure in cylinders	93.7 lbs.	112.5 lbs.
Total weight of locomotive and tender.	100,800 lbs.	.....
Weight of locomotive	65,480 lbs.	64,400 lbs.
Weight on driving wheels	50,540 lbs.	55,440 lbs.
Weight on each axle not to exceed	17,360 lbs.	17,360 lbs.

The following is a general specification of both classes:

Boilers, of iron ½ in. thick, with butt joints and welt strips inside and outside.

Fire-boxes of copper.

Tubes of seamless drawn brass.

Frames, square forged bar frames in accordance with American practice.

Wheel-centres, of cast iron. Driving, engine truck and tender wheels throughout with steel tires.

Feed-water, one pump and one injector.

Grates, of wrought iron.

Steam-chest valves, of brass.

Tender, carried on two centre bearing, four-wheel trucks.

Tank, wedge-shape, with coal carried on top of water-space.

Tender frame, of iron.

Engine trucks, with outside bearings.

The passenger locomotives were equipped with Westinghouse brakes, acting on all driving and tender wheels, and the freight locomotives with a screw hand-brake applying brakes on all the driving wheels.

Contributions.

Balancing the Revolving Weights on Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It is generally held by engineers that the weight of the crank-pin, crank-pin hub, end of main rod, and the whole of the side rods can be balanced by a smaller weight placed near the rim of the wheel, and consequently acting at a greater leverage. The moment of the balance-weight will then equal the moment of the crank-pin, etc., and the wheel as a whole will be balanced, in the sense that the centrifugal forces exerted by the weights will be of equal amounts, and exerted in diametrically opposite directions. This is undoubtedly true of a wheel revolving round a stationary axis, the fly-wheel of a stationary engine for instance. Engineers and scientific men, however, appear to have tacitly agreed that the same method of balancing will also hold good when applied to the driving wheel of a locomotive. This wheel rolls along the rails, and the axis instead of being stationary travels horizontally. The movement of the tread or periphery is also totally different from that of a fly wheel. In the latter, each part of the periphery is moving at the same speed at the same instant. In the driving wheel, the highest portion of the periphery is moving at double the speed of the engine, while the lowest portion, at the instant it touches the rails, absolutely stands still. In a flywheel, each portion of the periphery moves through the air in a circle, and at the lowest point in a revolution the movement of each portion is in a perfectly horizontal direction. In a driving wheel, any point in the periphery moves through the air in a cycloid, and at the lowest point of this curve the motion of a particle in the tread is absolutely vertical.

If, then, the movements of a fly wheel and a driving wheel are so totally different, why should a balancing arrangement which answers in one case answer in the other?

In the above brief statement of the relative movements of a fly wheel and a driving wheel, I have confined myself to the motion of the periphery, near which the balance weights are fixed. The relative motions through the air of the crank pins in a stationary engine and a locomotive differ quite as widely as the motions of points in the respective peripheries. In a stationary engine the crank pin revolves in a circle round a stationary point, and hence its path is exactly *similar* to that of a point in the periphery. The relative magnitude of the two paths depends wholly on the proportion of the stroke of the piston to the diameter of the fly-wheel. If the motion of the crank pin of a locomotive be considered, it will be found that it travels through the air in a wavy line, the length of which is somewhat greater than the distance traveled by the locomotive. The length of this path of the crank pin is little influenced by the proportion the stroke bears to the diameter of the wheel. I have already shown that in a stationary engine the relative length of the path of the crank pin depends wholly on this proportion.

It would therefore appear that comparing stationary engines and locomotives, the paths both of the balance weights and of the parts to be balanced are wholly dissimilar. Yet, most engineers apply balance weights to locomotives in precisely the same manner as they would apply them to stationary engines. This practice appears to me to be wholly wrong, and may account in large measure for the unsatisfactory results given by the present method of balancing locomotives.

I am aware that I am treading on dangerous ground in seeking to disprove the truth of accepted theory, but that theory appears open to question, and the subject is worthy of the attention of your readers, some of whom, I trust, will endeavor to point out where I am wrong.

INQUIRER.

The Trunk Lines' Agreement.

The following statement has been given out officially as the substance of the agreement adopted at the trunk line presidents' meeting last week:

"*Whereas*, Past experience has fully established the fact that joint action of competing railroad companies in establishing and adhering to uniform rates of transportation for like services to the public is necessary in order to avoid the evils of unjust discrimination and fluctuating rates so injurious to commercial as well as to the railroad interests,

"Therefore, the parties above named (all lines but Lehigh Valley), enter into the following contract for the purpose of establishing tariffs over their respective roads on competitive traffic, both passenger and freight, and of publishing said tariffs and strictly maintaining the same.

"All measures necessary to carry out this contract shall be taken jointly by the parties hereto, or jointly by such of the parties as may be directly interested, and should any question arise upon which they cannot agree in relation to the terms of this contract, or to any matter arising thereunder, it shall be decided by arbitration—it being one of the fundamental principles of this contract that no party shall take separate action in any matter affect-

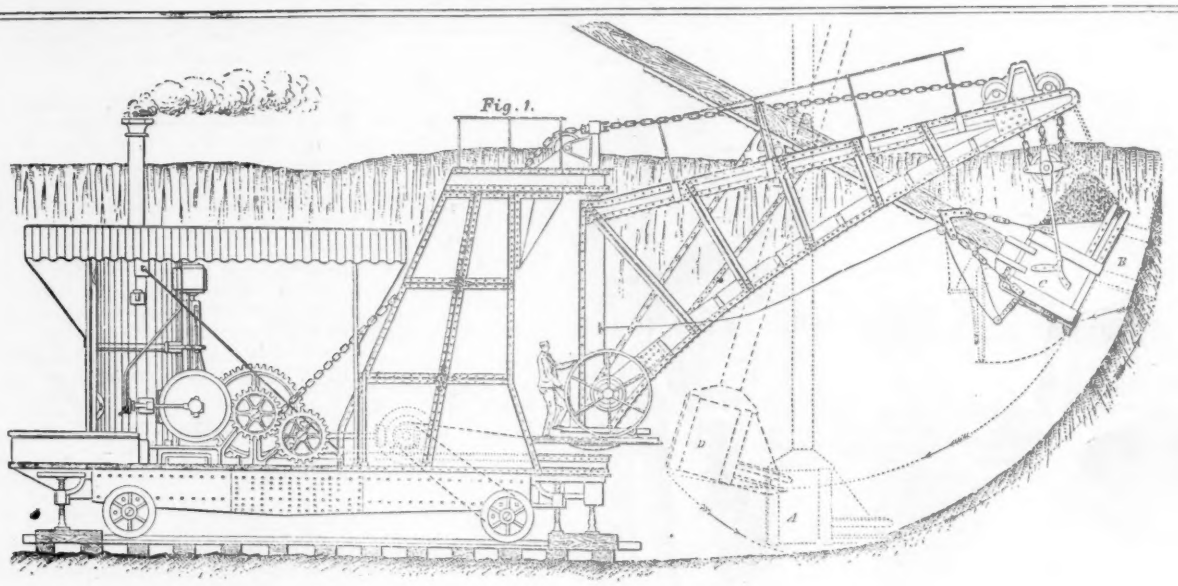


Fig. 1.

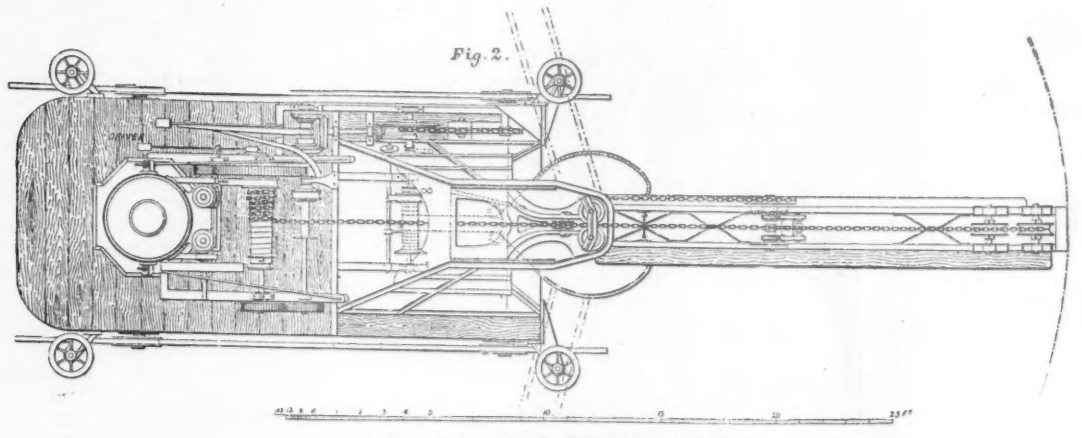


Fig. 2.

DUNBAR & RUSTON'S STEAM EXCAVATOR.

ing the interests of one or more of the parties contrary to the spirit and intent of this contract.

"The condition upon which the trunk lines will enter into a traffic arrangement with their connecting roads is, that said connecting roads will also strictly adhere to the established tariffs. It is an essential part of the contract that the trunk lines will not continue to be nor hereafter to become parties to any traffic arrangement with any of their connecting roads which decline or fail to maintain the established tariffs.

"The traffic arrangements referred to are: The issuing or honoring joint due bills of lading or through tickets; the interchange of through freight and passenger cars; the collection and advancing of through freight and passenger fares, or participating by divison in through rates or fares upon traffic covered by the contract.

"Provision is made for the method in which Western roads and the trunk lines are to agree upon tariffs. Each of the trunk lines further undertakes to fully control the maintenance of agreed rates and fares on its own road, as well as over its affiliated roads, so far as such rates and fares are subject to the contract. It is a fundamental principle of this contract that each trunk line shall act as the fully authorized agent and representative of its connecting roads on all matters connected with the maintenance of the joint tariffs, so far as traffic over its own road is concerned, and that no agent or officer or fast freight line agent of said connecting roads shall have the authority or power to vary from the agreed joint tariffs."

The Lehigh Valley is not a party to the agreement, for the reason that it is a coal road, and although in hearty co-operation with all the lines, it was not deemed necessary it should be a party.

Mr. Fink, commenting on the agreement, said: "This is a contract to regulate and maintain tariffs. There is not a word said about pools. The principal feature in the contract is that all lines will act as one body in making and maintaining rates. Pools may or may not be formed as incidental measures in carrying out the provisions of the contract."

The presidents of the Grand Trunk, the New York Central, the Lackawana, the West Shore, the Erie, the Lehigh Valley, the Pennsylvania and the Baltimore & Ohio companies will form a "Trunk Line Presidents' Committee," with authority to select an Arbitrator and Commissioner as they may determine. This Presidents' Committee will settle only broad questions of policy, the details growing out of the proposed contract being left to other committees, the idea being to limit as far as possible the questions to be submitted to the central authority, which will be the court of last resort. The Commissioner, who will be Secretary of the Presidents' Committee, will have the naming of the Trunk Line Executive Committee, which will consist generally of the vice-presidents. This Joint Executive Committee will appoint a Freight and a Passenger Committee, which will be made up of the traffic managers or general freight and passenger agents. The Commissioner, from the sub-committees, will select a Chairman, and to these will be given authority to act as Commissioners, one for freight business and a second for passenger traffic.

The plan thus proposes to fix as far as possible direct responsibility in the subordinate committees. No one will be appointed to a position, either upon the Passenger or the Freight Committee, who has not full authority in his own company over the department which he represents in the committee. Prompt action is provided for on any subject that may be brought to the attention of the committees, especial provision being made for the prevention of postponement of consideration on any question by the absence of any member of the committee, all the steps toward a final adjustment of disputed questions being made as easy and as rapid as possible, due consideration being given to strict justice to all the parties involved.

As a means of bringing this about, Commissioner Fink will probably be selected as Arbitrator, and the Chairmen of the Passenger and Freight Committees will also probably act as arbitrators, beside acting as chairmen of their respective committees. Whenever any complaint of a breach of contract for the strict maintenance of rates is made, the committee of the department affected will be convened at once. Should the representative of any company be absent the Chairman may act in his place, and whatever action is taken shall remain in force until such unrepresented company shall be present by its authorized agent. The arbitrators selected shall devote all their time to the work of the commission, and in case of a disagreement on the part of their respective committees they are authorized, upon an agreed statement of facts, to arbitrate at once, their decision remaining in force until a reversal by a higher committee.

The Executive Committee will therefore have no cause for action except on such matter as may be outside the question of tariffs and division of traffic, except upon appeals from the action of the Freight or Passenger Committee, and the Presidents' Committee will not have any special business except over such questions as the Executive Committee fail to agree upon, and the action of the subordinate arbitrators is appealed from. All this provides for carrying matters up to the highest authority, the Arbitrator himself, but the action of the majority is to stand in every case until reversed by the higher authority. Each of the trunk lines is made responsible for the acts of its Western connections, the New York Central being held for whatever infringement of the contract may be traced to the Lake Shore, the Michigan Central, the Canada Southern, or the Nickel Plate, and the Pennsylvania for the Fort Wayne, the Chicago, St. Louis & Pittsburgh, and the Pittsburgh, Cincinnati and St. Louis, and so on. All roads connecting with the trunk lines and their controlled roads are classed as affiliated roads, and are entitled to representation in the Joint Committee, which is made up of representatives of these roads and of the members of the Trunk Line Executive Committee. This Joint Committee will have authority over the classification of goods, the fixing of through rates, and will appoint special committees on certain classes of goods, such as cotton and tobacco, or any through freight which is carried over long routes and a number of lines. In case of a failure of the Joint Committee to agree upon any question, the appeal shall be to the Executive Committee.

Frequent reference is made all through the contract that it is to be observed in spirit, as well as in letter, the primary object being to provide for uniform and regulated rates on business passing over the trunk lines and affiliated roads. Rebates of any kind, time contracts, special rates, agreements for given amounts of freight, and all subterfuges by which the spirit of the union may be violated are forbidden. The business to be governed by this contract is, first, east-bound dead freight and live stock coming from or from beyond the western termini of the trunk lines; second, west-bound freight from the sea-board cities to the western termini of the trunk lines; third, competitive passenger traffic of the first and second class and emigrant traffic. Each party to this contract is to deposit a stated sum with the Commissioner, from which shall be deducted such fines as he may impose for violations of the agreement when proved and the method of detection and conviction is fixed.

American Society of Mechanical Engineers.

The sixth annual meeting of the American Society of Mechanical Engineers began in Boston on the evening of Tuesday, Nov. 10, about 100 members being present. The meeting was called to order by Mr. J. H. Woodbury, and addresses were made by Mayor O'Brien, who tendered the hospitalities of the city; Gen. Francis A. Walker, who offered the Society the use of the buildings of the Massachusetts Institute of Technology, and Mr. Edward Atkinson, who spoke of the benefits which mechanical engineers had conferred upon mankind.

The President, Mr. J. F. Holloway, then delivered his annual address, speaking at some length on the progress of engineering science and the usefulness of organized association on the part of mechanical engineers.

On Wednesday a business meeting was held at the Institute of Technology in the morning. In the afternoon the members inspected the Boston sewerage works, under the guidance of city officers and the local committee, and in the evening they were entertained at dinner at the Parker House.

The meeting was expected to continue until Friday. On Thursday two sessions were to be held for the reading of papers and discussion.

Dunbar & Ruston's Steam Excavator.

The following description of a steam navvy or excavator is slightly abridged from a paper read by Mr. Joseph Ruston before the Institution of Mechanical Engineers, (England). We are indebted to *Engineering* for the illustrations accompanying the paper:

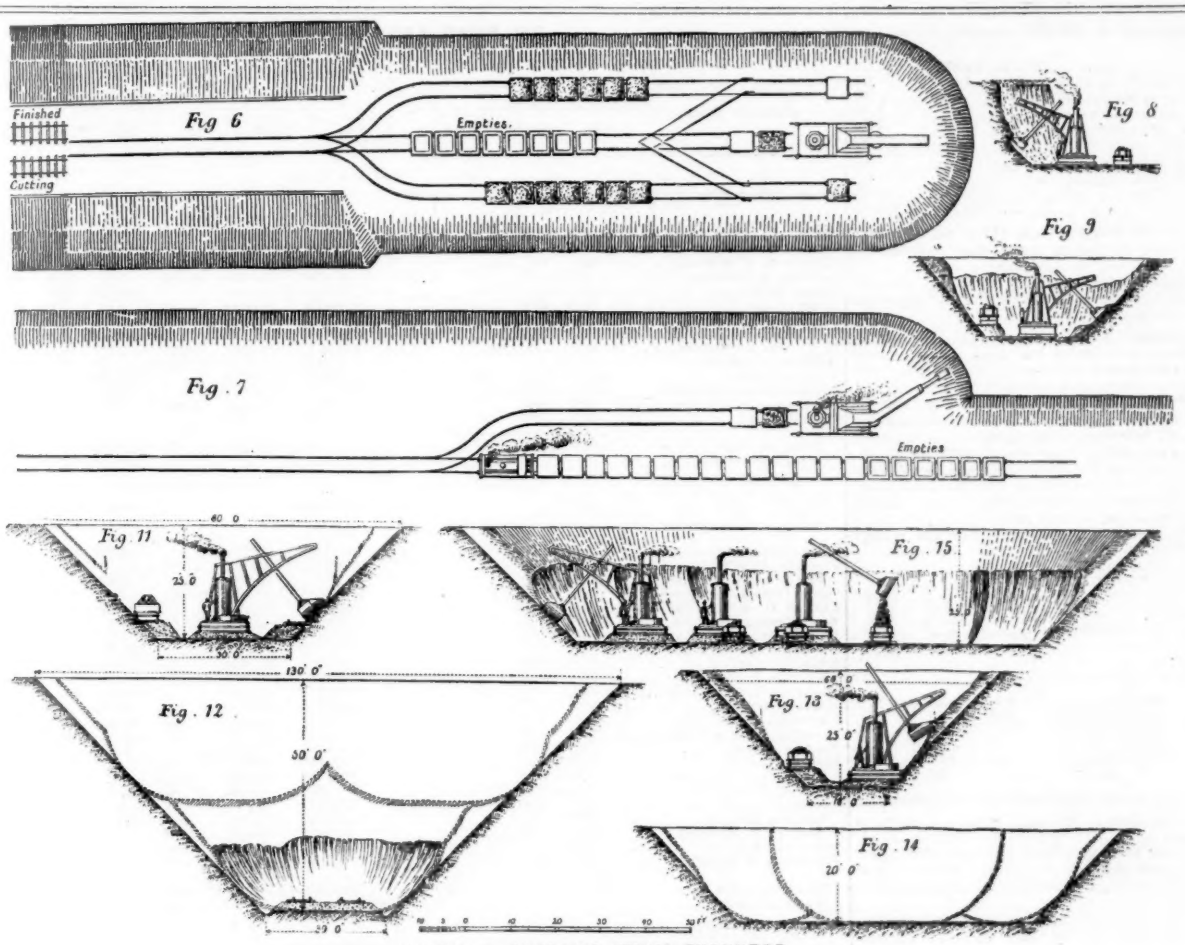
The steam navvy has been largely used in many important excavations in railway, dock, harbor and drainage works both in Great Britian and her colonies and in France. It excavates and delivers into wagons any material capable of being cut, such as sand, gravel, chalk, and clays of all kinds, digging out with equal facility the hardest and toughest, such as require blasting when worked by hand. It can also deal with these materials when thickly interspersed with stone and heavy bowlders, and without being unduly strained it cuts through thin seams of flint, shale, slate, or even sandstone. With the assistance of blasting it is also used in more difficult stuff, such as hard marl and lias rock.

Since its introduction, the machine has been much improved and strengthened, the standard weight being now 72,000 lbs. instead of 49,000 lbs., and the output 50 per cent. greater. At first 180 to 190 wagon-loads were considered a good day's work; now 240 to 250 are often obtained in a day of ten hours, the wagons being the size ordinarily used by contractors, holding three cubic yards each. With extra large wagons, holding four cubic yards each, an equal number has been filled in a day, equivalent to the grand total of nearly 1000 cubic yards per day.

Construction.—The machine is shown in the engravings, fig. 1 being an elevation and fig. 2 a plan. It consists of a strong rectangular wrought-iron frame mounted on wheels, forming a substantial base to which all the parts are secured. On the back end is placed the engine, beside which the driver stands. At the front end rises a wrought-iron tower carrying the top pivot of a crane jib, the lower pivot resting on girders fixed to the main frame. The jib is of twin construction, being composed of two sides which are united only at the post and at the outer end or point; between them, therefore, is a long slot, in which swings an arm of adjustable length, depending from a fulcrum fixed on the upper member of the jib; and at the base of the post is a circular platform on which a man stands to regulate, by means of a handwheel, the "reach" or length of radius of the arm. The scoop or bucket is fixed at the lower end of the arm, and is raised or lowered by the main chain passing over the extremity of the jib.

Handling.—The whole of the movements are controlled by two men, called the "driver" and the "wheelman." The driver raises the scoop while making its cut, swings it round into position for discharging; then he moves it back again and lowers it. The wheelman regulates the depth of cut, releases the scoop from the face of the bank, and opens the door or bottom for discharging its contents.

Supposing the excavator to be in position, the mode of working is as follows: The bucket having been lowered till its arm



DUNBAR & RUSTON'S STEAM EXCAVATOR.

is vertical, as shown by the dotted lines at *A* in the elevation, fig. 1, the wheelman regulates the length of the arm by means of his handwheel, so that the cutting edge of the bucket shall get its proper grip of the soil. The driver throws the main chain druuf into gear, and the scoop is dragged forward and upward by the chain into the position *B*, describing a circular arc of about 80 deg. By the time it reaches the top it is fully loaded, and the driver throwing the drum out of gear, holds it with a foot brake; at the same instant the wheelman by easing his foot brake allows the bucket to fall back to *C*, clearing itself from the face of the bank. The driver next swings the jib round till the bucket is over the wagon, when the wheelman releases the latch by means of a cord, and the door falling open, the contents instantly drop through. The driver then swings the jib back again, and at the same time lets go the foot brake of the chain drum, thus causing the bucket to descend through a sort of spiral course, until he brings it up sharply by the brake again when in position *D*. The wheelman at the same moment adjusts the fall by means of his brake, so as to lower the bucket to *A* again, with just the right reach of arm for the next cut. During the fall the door of the bucket closes and latches itself automatically by its own weight, and all is then ready for repeating the operation.

Although apparently somewhat complicated when thus performed in combination, the several movements are each very simple; and the whole cycle can be performed in less time than has been taken to describe it. Three-quarters of a minute is sufficient for scooping out from 1 to 2¼ tons of stuff, according to the capacity of the bucket, for dropping the stuff into the wagon, and for returning the scoop into place ready for another cut.

After the machine has dug out all within reach, the jack screws which steady it are eased, and the propelling gear being put in action, it is moved forward 3 ft. or 4 ft.; the screws are then tightened down, and another series of cuts is commenced. The cuts all radiate from the centre round which the jib swings; and they may together form a hole more or less resembling a crater, according to the plan adopted in making the excavation.

Plan of Excavation.—When making a cutting, the excavator first drives a "gullet," unless the excavation be commenced along the side of a bank or hill, as shown in figs. 7 and 8. The output depends mainly upon the completeness of the means for removing the excavated stuff.

The most effective way is to provide double roads, one on either side, branching out by proper curves from a central road, and also connected with the latter by short "jump" lines at abrupt angles immediately behind the excavator, as shown in fig. 6. On the central road are kept the empty wagons, and on each side is a man with a horse, by whom an empty wagon is brought forward along the jump to the side of the machine; and as soon as it is filled it is run back along the branch and another empty is brought up. Meanwhile the wagon on the other side is being filled; and while this is in its turn being exchanged for an empty, a second wagon is being filled on the first side. As the work thus proceeds on either side alternately, not a moment need be lost in waiting for wagons; and the jib has the minimum distance to swing round, the dirt from each half of its sweep being delivered on its own side. When, say, a dozen wagons have accumulated on each of the side roads, the shunting engine makes up a train, and takes them away to be tipped. The central siding behind the machine should be long enough for, say, 32 wagons at least; and other sidings are, of course, necessary if the "lead" to the tips be a long distance.

The gullet thus made may be 20 ft. or even 30 ft. deep, according to the nature of the stuff; but 25 ft. is about the most economical depth, because the machine has then sufficient reach to make the cutting exactly large enough for an ordinary double-line railway of standard gauge, the slopes requiring very little handwork to finish them, as shown by the section in fig. 11. In fig. 12 is shown a cutting 50 ft. deep for a similar railway, which can be best made by driving two excavators, one in advance of the other, to take out the first 25 ft.; and then finishing the lower half of the depth with a gullet similar to that shown in fig. 11. In each case the completed cutting is shown by the dark section, and the part to be taken out by hand by a light color. In the deep cutting, fig. 12, the sleepers and ballast of the permanent way are drawn in; while in the other, fig. 11, are shown the positions of the side roads while the work is in progress.

Where the railway has only a single line, as in fig. 13, the cutting must be made narrower; the excavator is then placed out of centre, and one side road only can be used. More attention is therefore required for keeping up the supply of empty wagons; and the jib having to swing round through a greater average distance, the output is not quite so good. In fig. 13 is represented a cutting 25 ft. deep for a single line.

After a gullet has been driven, the excavation may, however, be widened in another way, often employed in dock and harbor works, namely, by working along a "side face" with a single road, as shown in fig. 7. A train of empty wagons can then be drawn up alongside the excavator, and each truck as it is filled is pulled backward by the locomotive, so as to bring the next one into the right place for receiving the contents of the bucket, no horse being then required. But although this appears a very simple plan, it is found difficult in practice to move each wagon through just the right distance, and time is lost and the dirt spilt about. It is therefore best to store the empties behind the machine as before, and bring each forward over a jump to be loaded; in this way, with experienced men on the machine, two horses can be kept going. The jump lines should, of course, be as near to the machine as possible, and the central track should follow up close with the coal truck and the water-tank wagon. Two or more excavators also can be worked along the same face ahead of each other, the centre road forming the side road for the one behind, and so on, as in the section, fig. 15.

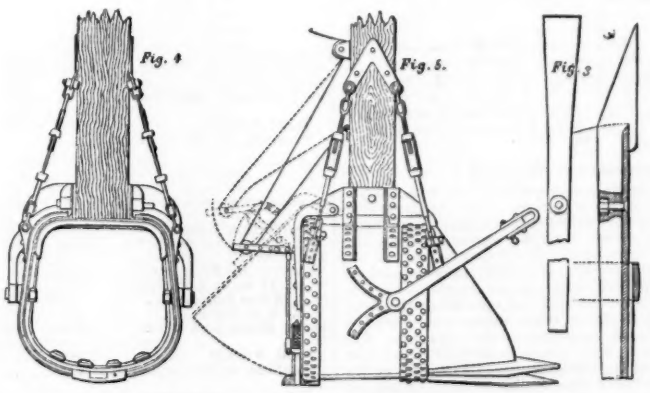
The size of the excavation, the material, the facilities for tipping, etc., will in each case determine which system can be used with the greatest advantage. With the hardest and most tenacious clay, about 22 ft. is the best depth, as then no wedging down is required of the stuff above the reach of the bucket teeth. With loose earth 30 ft. can be just as easily taken, since it all falls down to the machine. Within these limits, the deeper the face the better, as the greatest quantity can then be scooped out between each forward movement. To stop, ease the jack-screws, lay rails, run the excavator forward, tighten down the screws and get to work again, requires from 5 to 10 minutes, during which of course no wagons are filled. The fewer the stops in the day the greater will be the number of wagons filled; and the larger the quantity of material within reach of the bucket the less seldom need the navvy be moved forward. A good deep gullet offers, as a rule, the most advantage, because the whole of the semicircle in front of the machine can be cut round, and not merely part as in the side-face cutting; there is better facility for changing the wagons smartly, and there is a shorter average distance for the jib to swing through in order to get over the wagon. All these things economize time and increase the duty, for a few minutes loss now and then means fewer cubic yards cut out in the day.

Men Employed.—This depends more upon good management than upon the system employed. The driver and wheelman must work well together; and good sense and smartness are necessary for obtaining the best results. When handy and suitable men are chosen, their training is soon accomplished. The driver takes the lead, and is usually paid so much extra for each wagon filled per day beyond a stipulated number. If he fills 230 wagons, for instance, he receives his day's pay; but if 280 wagons, 1¼ day's pay; it is thus to his interest to take care no time is lost. Besides these two there is a fireman to stoke and clean.

The rest of the help depends upon the cutting. Usually one boss and eight men are required to act as plate-layers and lay the roads for the wagons and navvy, and to trim the slopes; one man on the top to break down the loose earth, and either one or two horses, with their drivers, or say a total of 15 men and two horses. Where the excavation is extra deep and of very hard material, another man may be required on the bank above, and perhaps extra help on the slopes. With these exceptions the labor remains fairly the same, whatever be the kind of stuff, unless blasting is necessary.

Output.—The output is affected by the hardness of the stuff. For the very hardest clay intermixed with stones and bowlders, capacity of the bucket is 1 cubic yard; for all other hard stuff 1¼ yards, which is the most useful size; while for loose earth, sand, gravel, or drift, 1½ or even 1¾ yards can be used.

For all sizes of bucket the number of cuts per hour remains approximately the same, about three-quarters of a minute



DUNBAR & RUSTON'S STEAM EXCAVATOR.

being the time necessary for each. Moving forward, laying rails, and waiting for wagons may be set down as a deduction of 10 minutes per hour, leaving 50 minutes for cutting, which gives, say, 60 as the number of bucket loads per hour, or 600 per day of 10 hours, as the theoretical capacity, equivalent to a daily output of 600, 750, and 900 cubic yards with the 1-yard, 1¼-yard, and 1½-yard buckets respectively; and this agrees well with the results actually obtained.

Working Expenses.—The following examples from actual practice in Great Britain give extreme results, the prices of coal and labor being very high in one case and very low in the other. The output was about equal, though two horses

and drivers were employed in the first example and but one in the second.

One engine driver	$1.80	$1.20
" wheelman	1.08	.96
" fireman	.84	.60
" ganger	2.00	1.08
Eight men	8.64	5.76
Horses and drivers	4.80	2.40
One man at top	1.08	.72
1,120 lbs. of coal	4.32	.72
Water, oil, and waste	.60	.66
Total per day	$26.16	$14.10

The average may be set down at from $17 to $19 per day. Depreciation, repairs and interest on capital may be reckoned as follows:

The total cost of the machine weighing 72,000 lbs. is about $6,100, including $375 (a liberal allowance) for carriage and erection on the site of the excavation.

Depreciation at 10 per cent.	$610
Repairs and renewals at 5 per cent.	305
Interest on outlay at 5 per cent.	305
Total per annum	$1,220

Allowing 270 actual working days in the year, these items will amount to $4.52 per day, or about ⅔ cent per cubic yard. The total cost per day is thus about $23, which, divided by the output, gives as the cost of excavation 3 cents per cubic yard for sand or gravel, and 4 cents for hard clay. Where the excavation is small, or the machine works under other disadvantages, these prices may rise 4 cents to 6 cents per cubic yard. The following table shows actual results obtained by contractors:

Kind of cutting.	Material.	Size of bucket. Cu. yd.	Cubic yards per day.	Cost per cubic yard, cents.
Dock works	Boulder clay.	1	480	3
Railroad cutting	Chalk, with stratum of flints.	1¼	500	5
Harbor works	Clay.	1	660	6
Dock works	Hard red marl.	1¼	940	4
" "	" " "	1½	740	5

The saving over hand labor is estimated at from 4 cents to 12 cents per yard, and is greater where the stuff is hard. Stiff brown clay has cost 21.5 cents by hand, and stiff hard tough clay containing bowlders varying from 1,000 to 9,000 lbs. has cost 36 cents by hand, and but 9.5 cents by one of the earliest machines sent out.

The machine greatly reduces the number of hands requisite, and is about equal to a force of sixty men. It is also faster than hand labor.

THE SCRAP HEAP.

Railroad Young Men's Christian Association.

The Association at Buffalo, at its recent annual meeting, received reports showing an unusual degree of prosperity. The Membership Committee reported an increase during the year ending Sept. 30 from 30 to 200 members. The Entertainment Committee reported 20 entertainments and lectures during the year, including 5 lectures on "First Aid to the Injured." The Treasurer reported all bills paid and a balance of cash on hand. The rooms of the Association have been much improved during the year, and are now comfortable and attractive to members. The statistical report shows an average of 122 visitors to the rooms per week day. Twenty entertainments were given, with a total attendance of 3,159 persons. There were 1,485 visits made to shops, trains, offices, etc., and 34 visits to sick and injured members. The number of religious meetings held during the year was 122, with a total attendance of 8,270 persons. The library has been open only four months, and during that time 311 books have been drawn out.

A Veteran Conductor.

Captain James Purcell, passenger conductor on the Georgia Railroad, has made for himself a record as a railroad conductor and long traveler which is not equaled by any living man. He has been running continuously as a passenger conductor on the Georgia Railroad for about 39 years and 7 months. He has never been suspended or discharged, and has never been off except when he went on a trip to Europe, and then the management of the road paid his expenses and kept up his salary. He has averaged one trip a day over the Georgia road during the entire time he has been running, and the distance is 171 miles. This makes 62,415 miles he has traveled each year. In the 39 years and 7 months he has traveled the immense distance of 2,475,695 miles. When he was absent in Europe he traveled between 8,000 and 9,000 miles, which make a grand total of about 2,482,545 miles! This would reach around the world about 99 times! Captain Purcell is still quite a vigorous man, though his once coal black beard is now whitening with the frosts of 65 winters. He is a grand-looking and handsome man, and his record is without an equal, perhaps, in the world. He is one of the oldest conductors in the United States, and we trust he may yet live to add many years of successful running to his already matchless life as a railroad passenger conductor. —*Covington (Ga.) Star.*

Another Test Examination Wanted.

It is all very well to make sure whether railroad employés are color-blind, but a most important want just now is to find out whether conductors and other trainmen are heat-deaf. The stove in the corner may be almost red-hot, and the atmosphere of the car stifling in its oppressiveness, but the officials of most trains have, apparently, come from school at Fort Yuma, and find it chilly at all degrees. Give us either car thermometers that will indicate when the stove drafts should be turned off, or train hands who will thaw out at 99° or thereabouts to a sense of the situation. The next Novelty Exhibition may produce both of these new species of railway stoves and railway man. For there is the curious anomaly that when a man ceases to be a passenger and goes into the railway service he becomes chilled metal and cold-of-hearing; that is, deaf to all entreaties of passengers to let up on the heat before the apoplectic point is reached.—*Philadelphia Ledger.*

The Baggage Smasher Smashed.

At one of the stations of the San Francisco & North Pacific Railroad a few Sundays since an elderly gentleman got off the cars to take brief observations during the stoppage of the train. The assistant at the station rushed out and made a regular baggage-smasher's attack on a trunk, which he slammed about with a reckless disregard for consequences. The old man interposed: "Young man, won't you break that trunk?" The "young man" turned a withering look upon the old gentleman and impudently inquired: "What's the matter with you; do you own this trunk?" "No, sir!"

RAILROAD EARNINGS IN SEPTEMBER.

Name of Road.	Mileage. 1885.	1884.	Inc.	Dec.	P. c.	Earnings. 1885.	1884.	Inc.	Dec.	P. c.	Earnings per Mile. 1885.	1884.	Inc.	Dec.	P.c.
EASTERN ROADS.															
Baltimore & Potomac	92	92				$ 112,071	$ 114,513	$	$ 2,442	2.1	$ 1,218	$ 1,245	$	$ 27	2.1
Boston, Hoosac Tun. & West.	87	87				44,844	46,737		1,893	4.1	515	537		22	4.1
Buffalo, N. Y. & Phila.	663	663				238,398	223,868	14,530		6.5	360	338	22		6.5
Danbury & Norwalk	37	37				24,478	21 690	2,788		12.9	662	586	76		12 9
Grand Trunk	2,977	2,977				1,298,603	1,480,934		182,331	13.0	436	498		62	13.0
Long Island	354	354				315,419	313,304	2,115		0.7	891	885	6		0.7
N. Y. & New England	400	400				345,312	281,638	63,674		22.6	863	704	159		22.6
N. Y., Ontario & Western	373	373				187,275	205,318		18,043	8.8	502	550		48	8.8
N. Y., Sus. & Western	147	147				105,354	95,417	9 937		10.5	717	649	68		10.5
Northern Central	322	322				504.753	476,81	27,942		5.8	1.568	1,481	87		5.8
Pennsylvania	2,310	2,180	130		5.9	4 276.628	4,458.871		182,243	4.1	1.851	2,045		194	9.5
Philadelphia & Reading	1,560	1,560				2,800,327	2,876.451		76,124	2.6	1,795	1,844		49	2.8
Rochester & Pittsburgh	294	294				115,832	109,026	6,806		6.2	394	371	23		6.2
West Jersey	200	189	11		5.9	125,123	131,405		6,282	4,8	626	695		69	10.0
Total, 14 roads	9,816	9,675	141			10,494,417	10,835,983	127,792	469,358		1,069	1,120		51	
Total inc. or dec			141		1.5				341,566	3.2				51	4.6
SOUTHERN ROADS.															
Alabama Great Southern	290	290				90,523	95.270		4,747	5.0	312	329		17	5.0
Chesapeake & Ohio	520	520				309.097	303,103	5,994		2.9	594	583	11		1.9
Eliz., Lex. & Big Sandy	130	130				72,519	75,951		3,432	4.5	558	584		26	4.5
Ches., Ohio & Southwestern	399	399				138,892	117,917	20,975		17.8	348	295	53		17.8
Cin., N. O. & Tex. Pacific	336	336				241,225	242,797		1,572	0.6	718	723		5	0.6
East. Tenn., Va. & Ga	1,100	1,100				379,424	369,311	10,113		2.7	345	336	9		2.7
Florida Ry. & Nav. Co.	540	500	40		8.0	64,978	60,737	4,241		7.0	120	121		1	0.8
Ill. Cen., Southern Div.	711	578	133		23.0	306,544	324,783		18,239	5.7	431	562		131	23.3
Kentucky Central	250	250				89.204	99,889		10,685	10.7	357	400		43	10.7
Louisville & Nash	2,015	2,065		50	2.4	1,146,977	1,145,366	1,611		0.1	569	555	14		2.5
Memphis & Charleston	292	292				105,195	110,384		5,189	4.7	360	378		18	4.7
Mobile & Ohio	527	527				159,789	160,668		879	0.5	303	305		2	0.5
Nashville, Chatta. & St. L.	580	574	6		1.0	192,865	210,586		17,721	8.4	333	367		34	9.3
N. Orleans & Northeastern	195	195				45,585	27,133	18,452		68.2	234	139	95		68.2
Norfolk & Western	512	503	9		1.8	267,373	270,010		2,637	1.0	522	537		15	2.8
Rich. & Danville	757	757				373,023	337,387	35,646		10.6	493	446	47		10.6
Char., Col. & Augusta	370	370				80,150	64,276	15,874		24.7	217	174	43		24.7
Col. & Greenville	296	296				63,400	51,130	12,270		24 0	214	173	41		24.6
Georgia Pacific	318	304	14		4.6	62,069	46,974	15,095		32.1	195	155	40		26.0
Virginia Midland	352	352				167,304	170,268		2,964	1.7	475	483		8	1.7
Western N. Carolina	274	274				45,864	42,879	2,985		7.0	167	156	11		7.0
South Carolina	247	247				113,427	109,599	3,828		3.5	459	444	15		3.5
Vicksburg & Meridian	142	142				36,918	41,483		4,565	11.0	260	292		32	11.0
Total, 23 roads	11,153	11,001	202	50		4,552,355	4,477.901	147,084	72,630		408	407	1		
Total inc. or dec			152		1.4			74,454		1.6			1		0.2
CENTRAL GROUP.															
Chi. & Eastern Illinois	252	252				165,506	153,874	11,632		7.5	657	611	46		7.5
Chi. & West Michigan	413	413				112,2 9	124,256		11,967	9.7	272	302		30	9.7
Cin., Ind., St. L. & Chicago	343	343				220,195	248,988		28,793	11.6	642	726		84	11.6
Cin., Wash. & Baltimore	281	281				151,291	186,055		34,764	18.5	538	662		124	18.5
Cleve., Akron & Columbus	144	144				47,927	46,587	1,340		3.0	333	323	10		3.0
Detroit, Lansing & No.	261	261				122,898	120,796	2,102		1 8	471	462	8		1.8
Evansville & Terre Haute	146	146				70,601	69,302	1,299		1.9	484	475	9		1.9
Flint & Pere Marquette	362	362				167,626	172,199		4,573	2.7	463	476		13	2.7
Illinois Central, Ill. lines	953	953				606,144	591,282	14,862		2.5	636	620	16		2.5
Ind., Bloom. & West	532	532				242,461	247,220		2,759	1.1	456	461		5	1.1
Ohio & Mississippi	615	615				344.618	357,152		12,534	3.5	560	581		21	3.5
Ohio Southern	230	130				59.074	40,584	12,690		27.4	454	357	97		27.4
Peoria, Decatur & Ev.	254	254				78,654	74,696	3,958		5.3	310	294	16		5.3
St. L., Alton & Terre Haute:															
Main Line	195	195				113,713	113,230	483		4.2	583	581	2		4.2
Belleville Line	138	138				72,643	62,191	10,452		16.9	526	451	75		16.9
Wabash, St. L. & Pacific	2,461	2,461				1,236,300	1,427,875		191,715	13.4	502	580		78	13.4
Total, 16 roads	7,480	7,480				3,811,800	4,040,087	58,818	287,105		510	540		30	
Total inc. or dec									228,287	5.6				30	5.6
NORTHWESTERN ROADS.															
Bur., Cedar Rap. & No.	990	714	276		39.0	299,973	261,160	38,813		14.8	303	366		63	17.1
Central Iowa	500	500				142,657	148,989		6,332	4.2	285	298		13	4.2
Chi. & Alton	850	850				754,291	916,164		162,673	17.7	887	1,079		192	17.7
Chi., Bur. & Quincy	3,500	3,411	89		2.3	2.640 035	2,707,110		67,075	2.5	754	794		40	5.0
Chi., Mil. & St. Paul	4,935	4,804	131		2.4	2,273,000	2,201,240	71,760		3.3	461	458	3		0.7
Chi. & Northwestern	3,843	3,763	80		2.1	2,383,300	2,346,914	36,386		1.5	620	624		4	0.6
Chi., St. P., Minn. & Omaha	1,320	1,300	20		1.5	572,900	527,884	45,016		8.4	434	406	28		6.9
Des Moines & Ft. Dodge	138	138				40,695	41,882		1,187	2.9	295	303		8	2.9
Ill. Central, Iowa lines	402	402				157 391	166,626		9,235	5.5	392	414		22	5.5
Marquette, H. & Ont.	160	138	22		15 7	117.198	102,828	14.370		14.0	732	745		13	1 7
Mil., Lake Shore & West	512	390	122		31.3	144.805	99,208	45,597		45.6	283	254	29		11.5
Mil. & Northern	227	227				46.873	46 338	535		1.0	206	204	2		1.0
Minneapolis & St. L.	355	355				147,083	168,573		21,490	12.7	414	475		61	12.7
Wisconsin Central	440	440				117,323	112,686	4,637		4.1	267	256	11		4.1
Total, 14 roads	18,172	17,432	740			9.837,524	9,848,402	257,114	267,992		541	565		24	
Total inc. or dec			740		4.2				10,878	0.1				24	4.2
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pacific	2,794	2,500	294		11.8	823,487	639,840	183,647		28.7	295	256	39		15.2
Northern Pacific	2,691	2,453	238		9.7	1,224.955	1,236,560		11,605	0.9	455	508		53	10.4
St. P. & Duluth	227	227				172,572	152,142	20.429		13.4	760	670	90		13.4
St. P., Minn. & Manitoba	1,471	1,400	71		5.1	740,845	738,586	2,259		0.3	504	528		24	4.6
Total, 4 roads	7,183	6,580	603			2,961,859	2,767,129	206,335	11,605		412	421		9	
Total inc. or dec			603		9.2			194.730		7.0				9	2.2
SOUTHWESTERN ROADS.															
Fort Worth & Denver	144	110	34		30.9	39,677	40,067		390	0.9	276	364		88	24.2
Gulf, Colorado & Santa Fe.	550	536	14		2.2	211,048	185,271	25,777		13.4	384	346	38		10.9
Kan. City, Ft. Scott & Gulf.	389	389				210,144	191,751	18,393		9 6	540	493	47		9.6
Kan. City, Sp'f'd & Memp.	282	282				103,021	90,756	12,265		13.6	365	322	43		13.6
St. L., Ft. Scott & Wichita	215	160	55		34.4	63,267	47,363	15,904		33.8	294	296		2	0.7
St. L. & San Francisco	804	775	29		3.7	398,508	462,943		64,435	14.0	496	597		101	16 9
Texas & St. Louis	735	735				128,848	127,997	851		0.7	175	174	1		0.7
Vicks., Shreveport & Pac.	170	170				39,994	35,521	4,473		12.6	235	209	26		12.6
Total, 8 roads	3,289	3,157	132			1,194,507	1,181,669	77.663	64,825		363	374		11	
Total inc. or dec			132		4.1			12,838		1.1				11	2.9
FAR WESTERN AND PACIFIC ROADS.															
Atchison, Top. & Santa Fe.	2,397	2,377	20		0.8	1,385,584	1,513,046		127,462	8.4	578	637		59	9.2
Denver & Rio Grande	1,317	1,317				561,893	521,957	39,936		7.6	427	396	31		7.6
Denver & R. G. Western	368	368				100.896	82.592	18,304		22.1	274	224	50		22.1
St Joseph & Grand Island.	252	252				112,203	111.941	352		0.3	446	444	2		0.3
Union Pacific	4,476	4,256	220		5.1	2,518,122	2,486.827	31,295		1.3	563	584		21	3.6
Total, 5 roads	8,810	8,570	240			4,678,788	4,716.363	89,887	127 462		531	550		19	
Total inc. or dec			240		2.8				37,575	0.8				19	3.5
GRAND TOTAL:															
Total, 84 roads	65,903	63,895	2,058	50		37,531,250	37,867,534	964,693	1,300,977		569	593		24	
Total inc. or dec.			2 008		3.1				336,284	0.9				24	4.0

RAILROAD EARNINGS, NINE MONTHS TO SEPTEMBER 30.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1885.	1884.	Inc.	Dec.	P. c.	1885.	1884.	Inc.	Dec.	P. c.	1885.	1884.	Inc.	Dec.	P. c.
EASTERN ROADS.															
Balt. & Potomac	92	92	....	....	....	$ 974,269	$ 903,207	$ 71,062	$	7.9	$ 10.590	$ 9,817	$ 773	$	7.9
Bos., Hoos. T. & W.	87	87	....	....	....	339,087	334,317	4,770	.....	1.4	3,898	3,843	53	....	1.4
Dan. & Norwalk	37	37	....	....	....	168,251	158,583	9,668	.....	6.2	4,547	4,286	261	....	6.2
Grand Trunk	2,951	2,951	....	....	....	10,986,650	12,479,003	.....	1,492,353	11.9	3,723	4,229	....	506	11.9
Long Island	354	354	....	....	....	2,250,324	2,204,390	45,934	.....	2.1	6,357	6,227	130	....	2.1
N. Y. & New Eng.	400	400	....	....	....	2,155,369	2,145,714	9,655	.....	0.4	5,388	5,364	24	....	0.4
N. Y., Ontario & W.	373	373	....	....	....	1,401,609	1,466,952	.....	65,343	4.4	3,758	3 933	....	175	4.4
N. Y., Susq. & W.	147	147	....	....	....	803,518	750,190	53,328	.....	7.1	5,466	5,103	363	....	7.1
Northern Central	322	322	....	....	....	3,965,618	4,085,008	....	119,390	2.9	12,316	12,686	....	370	2.9
Pennsylvania	2,275	2,124	151	....	7.1	33,236,640	36,398,108	.....	3,161,468	8.7	14,610	17,137	....	2,527	16.0
Phila. & Reading	1,560	1,560	....	....	....	21,093,193	23,161,923	....	2,068,730	8.9	13.521	14,847	....	1,326	8.9
Rochester & Pitts.	294	294	....	....	....	886,452	830,801	55,651	.....	6.7	3,015	2,826	189	....	6.7
West Jersey	200	189	11	....	5 9	1,018,061	1,060,815	.....	42,754	4.0	5,090	5,612	....	522	9 3
Total. 13 roads	9,092	8,930	162	..	....	79,279,041	85,979,011	250,068	6,950,038	....	8,720	9,628	....	908	....
Total inc. or dec.	.....	.....	162	....	1.8	.....	.....	.....	6,699,970	7.8	.....	.....	....	908	9.5
SOUTHERN ROADS.															
Ala. Gt. Southern	290	290	....	....	....	757,576	782,601	.....	25,025	3.2	2,612	2,699	....	87	3.2
Ches. & Ohio	520	520	....	....	....	2,454,924	2,683,433	.....	228,509	8.7	4.721	5,160	....	439	8.7
Eliz., Lex. & B.S.	130	130	....	....	..	504,509	557,240	.....	47,731	8.6	3,929	4,286	....	357	8.6
Ches., O. & S'west.	399	399	....	....	....	1,108,916	963,430	148,486	.....	15.3	2,779	2,407	372	....	15.3
Cin., N O. & Tex. P.	333	336	....	....	....	1,910,015	1,915,574	.....	5,559	0.3	5,685	5,701	....	16	0.3
E. Tenn., Va. & Ga.	1,100	1,100	....	....	....	2,898,432	2,824,350	74,082	.....	2.6	2,635	2,568	67	....	2.6
Fla. Ry. & Nav. Co.	532	489	43	....	8.7	690,564	704,155	.....	13,591	1.9	1,298	1,440	....	142	9.9
Ill. Cent., So. Div.	711	578	133	....	23.0	2,902,895	2,747,449	155,446	.....	5.7	4.053	4,753	....	700	14.8
Kentucky Cent.	250	224	26	....	11.6	623 350	677,152	.....	53,802	8.0	2,493	3,023	....	530	17.5
Louisville & Nash.	2,033	2,065	....	32	1.5	10,116,654	9,879.028	237,626	.....	2.4	4,976	4,784	192	....	4.0
Mem. & Charleston	292	292	....	....	....	896,159	985,619	.....	89,460	9.0	3,069	3,375	....	306	9.0
Mobile & Ohio	527	527	....	....	....	1,316,597	1,409,984	.....	93,387	6.6	2,498	2,675	....	177	6.6
Nash., Chat. & St. L.	576	559	17	....	3.0	1,567,866	1,761,432	.....	193,566	11.0	2,722	3,151	....	429	13.6
N. O. & Nor'east.	195	195	....	....	....	443,846	271,352	170,494	.....	62.3	2.276	1,402	872	....	62 3
Norfolk & Western	512	503	9	....	1.8	1,965,075	1,930,744	34.331	.....	1.8	3,838	3,838	....	....	....
Rich. & Danville	757	757	....	....	....	2,823,844	2,706,560	117.284	.....	4.3	3,730	3,575	155	....	4.3
Char., Col. & Aug.	370	361	9	....	2.5	561,415	511,120	50,295	.....	9.8	1,517	1,416	101	....	7.2
Col. & Greenville	296	296	....	....	....	454,197	418.743	35,454	.....	8.5	1.534	1,415	119	....	8.5
Ga Pacific	318	293	25	....	8.6	458.412	390,146	68,266	.....	17.5	1.440	1,332	108	....	8.1
Va. Midland	352	352	....	....	....	1,134,785	1,184,174	.....	49,389	4.2	3,224	3,364	....	140	4.2
Western N. C	274	222	52	....	23.4	337,544	318,328	19,216	....	6.0	1.232	1,452	....	222	15.3
South Carolina	247	247	....	....	....	781,251	810,913	.....	29,662	3 6	3,163	3,283	....	120	3.6
Vicks. & Meridian	142	142	.. ..	....	....	299,331	335,023	.....	35,692	10.6	2,108	2,360	....	252	10.6
Total, 23 roads	11,159	10,877	314	32	....	37,013,157	36,767,550	1,110,980	865,373	....	3,317	3,380	....	63	....
Total inc. or dec.	.....	.....	282	....	2.6	.....	.....	245,607	.....	0.7	.... ..	.... ..	....	63	1.9
CENTRAL GROUP.															
Chi. & Eastern Ill.	252	252	....	....	....	1,168,594	1,121,153	47,441	.....	4.2	4,637	4,449	188	....	4.2
Chi. & West Mich.	413	413	....	....	....	941,622	1,141,271	.....	199,649	17.5	2,280	2,763	....	483	17.5
Cin., Ind., St. L. & Chi	343	343	....	....	....	1,740.276	1,794,229	.....	53,953	2.9	5,074	5,231	....	157	2.9
Cin., Wash. & Balt.	281	281	....	....	....	1,249,215	1,360,201	.....	110,986	8.2	4.446	4,841	....	395	8 2
Cleve., Akron & Col.	144	144	....	....	....	363,815	362,776	1,039	.....	0.3	2,527	2,520	7	....	0.3
Det., Lan. & No.	261	261	....	....	....	880,530	1,014,534	.....	133,998	13.2	3,374	3,887	....	513	13.2
Ev. & Terre Haute.	146	146	....	....	....	553,587	564,375	.....	10,788	1.9	3,792	3,865	....	73	1 9
Flint & Pere Marq.	362	362	....	....	....	1,405,559	1,734.824	.....	329,265	19.0	3,883	4,792	....	909	19.0
Ill. Cen., Ill. lines	953	953	....	..	..	4,690,826	4,493,872	196,554	.....	4.4	4,922	4,718	206	....	4.4
Ind., Bloom. & W.	532	532	....	....	....	1,743,906	1,724,534	19,372	.....	1.1	3,278	3,242	36	....	1.1
Ohio & Mississippi	615	615	....	....	....	2,699,145	2,788,970	.....	89,825	3.2	4,389	4,535	....	146	3.2
Ohio Southern	130	130	....	....	....	324,945	329,833	....	4,888	1.5	2,500	2,537	....	37	1.5
Peoria, Dec. & Ev.	254	254	....	....	....	541,028	576,051	.....	35,023	6.1	2,130	2,268	....	138	6.1
St. L., Alton & T. H:															
Main Line	195	195	....	....	....	878,940	986,943	....	108,003	10.9	4,507	5,061	....	554	10.9
Belleville Line	138	138	....	....	....	534,468	543,334	.....	8,866	1.6	3,873	3,937	....	64	1.6
Wab., St. L. & Pac.	3,122	3,463	....	341	9.8	10,199,124	11,167,885	.....	968,761	8.7	3,267	3,225	42	....	1.3
Total, 16 roads	8,141	8,482	....	341	....	29,915,586	31,704,785	264,806	2,054,005	....	3,675	3,738	....	63	....
Total inc. or dec.	.....	.....	....	341	4.0	.....	.....	.....	1,789,199	5.6	.....	.....	....	63	1.6
NORTHWESTERN ROADS.															
Bur., Ced. Rap. & No.	964	714	250	...	35.6	2,164,098	1,952,463	211,633	....	10.3	2,245	2,734	....	489	18.0
Central Iowa	500	500	....	....	....	906,860	1,052,421	.....	145,561	13 8	1,814	2,105	...	291	13.8
Chi. & Alton	850	850	....	....	....	5,786,018	6,373,669	.....	587,651	9.2	6,807	7,498	....	691	9.2
Chi., Bur. & Quincy	3,476	3,343	133	.. ..	4 0	19,050,141	18,505.825	544,316	....	3.0	5,480	5,536	....	56	1.0
Chi., Mil. & St. P.	4,833	4.770	63	....	1.3	16,549,000	16,403,976	145,024	.....	1.8	3,426	3,436	....	10	0.3
Chi. & N. W.	3,840	3,760	80	....	2.1	17,028,502	17,019,700	8,792	.....	0.1	4,429	4,527	....	98	2 1
Chi., St. P., M. & O.	1,316	1,296	20	....	1.5	4,033,983	4,157,323	.....	123,340	3.0	3,065	3,208	....	143	4.5
Des Moines & Ft. D	138	138	....	....	....	267,090	256.004	11,086	.....	4.3	1,935	1,855	80	....	4 3
Ill. Cent., Iowa lines	402	402	....	....	....	1,157.759	1,224,813	.....	67,054	5.5	2,880	3,047	....	167	5.5
Marquette, H. & O.	145	123	22	....	18 0	645,990	704,935	.....	58,945	8.4	4.455	5,731	....	1,276	22 3
Mil., L. S. & W.	490	376	114	....	30.3	937,241	827,676	109,565	.....	13.2	1,913	2,201	....	288	13.1
Mil. & Northern	227	227	....	....	....	408,773	381,763	27,010	.....	7.1	1,801	1,681	120	....	7.1
Minneap. & St. L.	355	355	..	....	....	1,251.826	1,301,187	.....	49,361	3.8	3,526	3,665	....	139	4.8
Wisconsin Central	440	440	....	....	....	1,030,862	1,011,182	19,680	.....	2.0	2,343	2,296	47	....	2.0
Total, 14 roads	17,976	17,294	682	....	....	71,218,231	71,173,037	1,027,106	1,031,912	....	3,962	4,114	....	152	....
Total inc. or dec.	.....	.....	682	....	4.0	.....	.....	45,194	.....	0.1	.....	.....	....	152	3.8
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pacific	2,794	2,250	544	....	24.2	5,908,654	3,853,066	2,055,588	.....	53.3	2,115	1,512	603	....	39.9
Northern Pacific	2,527	2,450	77	.. ..	3.1	7,802,685	9,277,186	.....	1,474,501	15.9	3,088	3,787	....	699	18.4
St. P. & Duluth	227	227	....	....	....	915,181	891.503	23,678	.....	2.6	4,032	3,927	105	....	2.6
St. P., Minn. & Man	1,422	1,372	50	....	3.6	4.939,840	5,600.455	.....	660,615	11.8	3,474	4,082	....	608	14.8
Total, 4 roads	6,970	6,299	671	...	....	19,566,360	19,622.210	2,079,266	2,135,116	....	2,807	3,115	....	308	....
Total inc. or dec.	.....	.....	671	...	10.7	.....	.....	.....	55,850	0.3	.....	.. ...	....	308	9.7
SOUTHWESTERN ROADS.															
Ft Worth & Den.	128	110	18	....	16.4	343,788	361,744	.....	17,956	4.9	2,686	3,289	....	603	18.3
Gulf, Col. & S. F.	538	536	2	....	0.4	1,082,323	1,213,830	.....	131,507	10.8	2,012	2,265	....	253	11.1
K. C., Ft. S. & Gulf	389	389	....	....	....	1,839,448	1,751,488	87,960	.....	5.0	4,728	4,503	225	....	5.0
Kan. C. Spr. & Mem	282	282	....	....	....	1,126,184	829.986	296,198	.....	35.7	3,994	2,943	1,051	....	35.7
Little Rock & Ft. S	168	168	....	....	....	371,186	355.174	16,012	.....	4.5	2.209	2,114	95	....	4.5
L. R., M. R. & Tex.	170	170	....	....	....	211,614	227,480	.... ..	15,866	7.0	1,245	1,338	..	93	7.0
St. L., Ft. S. & W.	200	160	40	....	25.0	455,488	366,814	88,674	.... ..	24.2	2,277	2,293	....	16	0.7
St. L. & San Fran.	804	761	43	....	5.7	3,062.309	3.381.264	.....	318,955	9.4	3,809	4.443	....	634	14.3
Texas & St. Louis	735	735	....	....	....	765,727	673,584	92,143	.....	13.7	1.042	916	126	....	13.7
Vicks., Sh. & Pac.	170	131	39	....	29.8	250,8 3	135,262	115,541	.....	85.5	1,475	1,033	442	....	43.0
Total, 10 roads	3,584	3,442	142	....	....	9,508,870	9,296,626	696,528	484,284	....	2,653	2,701	....	48	....
Total inc. or dec.	.....	.....	142	....	4.2	.....	.....	212,244	.....	2.3	.....	.....	....	48	1.8
FAR WESTERN AND PACIFIC ROADS.															
At., Top. & S. Fe.	2,379	2,334	45	....	1.9	11,038,534	11,852,819	.....	814,285	6.9	4,640	5,078	...	438	8.6
Denver & R. G	1,317	1,317	....	...	....	4,402,411	3,966 001	436,410	.....	11.0	3,343	3,011	332	...	11.0
Denv. & Rio G. W.	368	368	....	....	....	708.502	570.625	137,877	.....	24.1	1,936	1,551	385	...	24.1
Union Pacific	4,476	4,256	220	....	5.1	18,378,778	18.274,253	104,525	... .	0.6	4,106	4,294	...	188	4 4
Total, 4 roads	8,540	8,275	265	...	....	34,528,225	34,663,698	678,812	814,285	....	4,043	4,189	....	146	....
Total inc. or dec	.....	.....	265	....	3.2	.. ..	.....	.....	135,473	0.4	.....	.....	....	146	3.5
GRAND TOTAL:															
Total, 84 roads	65,462	63,599	2,236	373	....	281,029,470	289,206,917	6,157,566	14,335,013	....	4,293	4,547	...	254	....
Total inc. or dec.	.....	.....	1,863	....	2.9	....	.....	.....	8,177,447	2.8	.....	.....	....	254	5.6

came back in a tone that evinced much indignation, "but I'll have you to understand, Sir, that I own this railroad." As Colonel Donahue moved back to the train the limp young man reclined against the station for support.—*Healdsburg (Cal.) Enterprise.*

Moving a Station.

The Buffalo, New York & Philadelphia and the Nickel Plate roads had a moving job on hand on Sunday last. The two companies wanted to move the station building from Earnham to Hamburg-on-the-Lake, a distance of 15 miles, where the tracks run side by side. Early on Sunday morning a flat car was placed on each track, and the building was put upon them. Two engines running parallel with each other were attached to the cars and together they drew the station to its new resting place, where it was unloaded and made ready for business Monday morning.—*Buffalo Express.*

Stealing a Passenger Train.

Bernard Fitzgerald, of Audenried, was in Pottsville, Wednesday, and meeting with some old cronies imbibed too freely. He sauntered down to the depot about 5:30 o'clock, and seeing engine No. 139 standing in the yard, with passenger cars, and nobody on board, he jumped into the cab, pulled the lever, and in a second was speeding down the road. The crew was not about, and no one saw the act of the intoxicated man until the train was pulling out, when it was too late to stop him. It was by the merest chance that the man's crazy act did not result in a terrible accident, for he started the train out just as the Frackville train was coming in at full speed. The switchman above the bridge, John A. Rath, observed both trains coming toward each other on the same track, and signalled to the Frackville train to stop. Fitzgerald, who is probably an engineer, also by force of habit, involuntarily obeyed the signal and stopped his train also. The trains would have run into each other in less than a second's time. As the engine stopped, one of the employés jumped into the cab, took possession of the lever, and the drunken man was ejected without much ceremony. He was taken into custody and a warrant sworn out against him on the charge of interfering with the company's property and endangering the lives of employés and passengers. He was held in $1,000 bail by the Justice, in default of which he was sent to jail.—*Pottsville (Pa.) Miners' Journal, Nov. 6.*

An Expensive Ticket.

Yesterday the Fitchburg (Hoosac Tunnel route) sold a ticket to Denver and return for $82,481.47, which is believed to be the highest price ever paid in Boston for a single ticket. It was for a party of nine in a special car, with stop-off privileges, which involved the making of a special time schedule. The price affords a faint suggestion that rates have been restored.—*Boston Advertiser, Nov. 11.*

A Little Out in Local Geography.

The Chicago *Inter-Ocean* of Nov. 7 says: "The current number of *Harper's Weekly* contains a good picture of the new Dearborn Station on Polk street, at the head of Dearborn street, Chicago, and says that it was built by four railroads (the Chicago, Milwaukee & St. Paul, the Pittsburg, Fort Wayne & Chicago, the Chicago & Alton, and the Chicago, Burlington & Quincy) for the purpose of conveniently transferring passengers and baggage.' If *Harper's Weekly* had mentioned that the union depot of the four roads named above was situated over a mile from Dearborn Station, and that the new depot had been built by the Chicago & Western Indiana Road, and was occupied by the Chicago & Grand Trunk, the Louisville, New Albany & Chicago, the Wabash, St. Louis & Pacific, the Chicago & Atlantic, and the Chicago & Eastern Illinois roads it would have been more correct."

A Runaway Train.

On Monday evening last an east-bound freight train stopped at Kittanning Point to get some cars off the coke works siding. While going across the west-bound tracks to the siding the engineer, Mr. S. A. Short, noticed that part of his train on the main track was commencing to move on, and in order to stop it he run his engine out again so as to get ahead of it. He did so, but it was then coming with such speed that he could not hold it, there being but one brakeman on that part of the train. The fireman also went back over the train and put on brakes, but as the rails were wet and icy the brakes seemed to have no effect. When nearing Wike's farm west of the city, the brakeman jumped off the train, thinking that there would be no chance of stopping before being smashed to pieces in the Altoona yard. On reaching Narcross' cut the engineer and fireman noticed a red light in front of them, and after reversing the engine both jumped. Engineer Short was considerably bruised, and had part of his left foot crushed by rolling back partly under his train. Fireman Casey got off with a few slight bruises. The train continued on its flight down to Seventeenth street, where it stopped without doing any further damage. This was caused from the fact that Engineer J. T. Delozier, with engine No. 555, who had been helping a train up the mountain, was coming down ahead of him, and whose red light was seen near the Narcross cut, found that the train was running away he commenced to sand the track and got out of its way, and as soon as the train came on the sanded track the brakes commenced to take effect and it stopped—*Altoona (Pa.) Sun, Nov. 7.*

An Unpleasant Traveling Companion.

The tourists in a Pullman car coming down from El Paso last night over the Southern Pacific had a lively time of it. Mr. Roberts, agent of a Dallas paper at El Paso, had a pass and a comfortable berth. Some time late in the night a tall, powerful man reached his hands into Roberts' berth, grasped him by the shoulder, shook him violently, and said:

"Look here, get up; let's go in swimming."

"What?" shrieked Roberts, bouncing up.

"Go in swimming, —— you," yelled the man, springing upon him.

Roberts screamed and half the male occupants of the car rolled out in toilette de nuit, and went on board the tall stranger. He had commenced "shucking" himself preparatory to his imaginary plunge, and despite the protests of the feminine occupants and the united strength of six men succeeded in divesting himself of all clothing down to his underclothes, and there he paused, weighted down by his opponents. After much solicitation he was prevailed upon to don some of his clothing, but drew the line at his shirt, sternly refusing to do any more dressing that night. He was plainly a maniac, and Roberts, in common with several others, perched on their berths and watched him until morning. He vigorously insisted at intervals on the necessity of all his hearers, male and female, taking a bath, but beyond his ablutionary chatter and a few yells, made no demonstration. On arriving in San Antonio in the early morning he broke away from his companions, rushed over to a fat colored woman at the depot, threw his arms around her neck, imprinted a vigorous smack upon her cheek and rushed down the street. He has not been seen since. Roberts says he was interesting, but slightly fatiguing. He is a German and is believed to live in El Paso. The city police are now looking for him.—*San Antonio Dispatch, Nov. 1.*

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

SEPTEMBER EARNINGS.

Our table of earnings in September this week has reports from 84 railroads, showing in the aggregate as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Miles	65,903	63,895	+ 2,008	3.1
Earnings	$37,531,250	$37,867,534	— $336,284	0.9
Earnings per mile	569	593	— 24	4.0

As we have noted before, the decrease was much smaller than for several previous months, the total amount of decrease and the percentage of decrease in earnings per mile in successive months having been:

	Amount	P. c. per mile.		Amount	P. c. per mile.
Jan. (inc.)	$43,375	3.2	June (dec.)	$749,178	4.8
Feb. (dec.)	985,539	7.0	July (dec.)	968,112	4.8
March (inc.)	536,012	1.2	Aug. (dec.)	2,592,125	9.9
April (dec.)	2,095,761	9.5	Sept. (dec.)	336,284	4.0
May (dec.)	2,401,597	11.1			

Not since March has the decrease been so small. It was less than 1 per cent. of the total earnings, though 4 per cent. of the earnings per mile, in September.

The comparison, however, is with a very unfavorable month, total earnings in October last year being $2,100,249 less than in 1883, and earnings per mile 10.8 per cent. less. In 1883, the 79 roads reporting had a very large increase over 1882 in total earnings, but substantially the same earnings per mile.

The four railroads northwest of St. Paul had in the aggregate last September:

	1885.	1884.	Inc. or Dec.	P.c.
Miles	7,183	6,580	+ 603	9.2
Earnings	$2,961,859	$2,767,129	+ $194,730	7.0
Earn. per mile	412	421	— 9	2.2

The gain was chiefly on the Canadian Pacific, the Northern Pacific having a slight decrease, and the Manitoba a trifling increase, the St. Paul & Duluth, which alone has no increase in mileage, a large increase.

The aggregate gains or losses of these four railroads for five months have been:

April.	May.	June.	July.	Aug.	Sept.
$346,213 Loss.	$375,334 Loss.	$174,520 Loss.	$306,390 Gain.	$146,021 Gain.	$194,730 Gain.

The improvement over August is not very great, and the gain is much less than in July, but there is a great gain over earlier months.

Of the other roads west and northwest of Chicago, 14 report:

	1885.	1884.	Inc. or Dec.	P.c.
Miles	18,172	17,432	+ 740	4.2
Earnings	$9,837,524	$9,848,402	— $10,878	0.1
Earnings per mile	541	565	— 24	4.2

The aggregate earnings were nearly the same in both years, and about half the roads show gains, though only five of the 14 have an increase in earnings per mile. The only large gain in earnings per mile is 11½ per cent., by the Milwaukee, Lake Shore & Western.

The same 14 roads had an aggregate decrease of $494,757 in August, and a decrease of 10.3 per cent. in earnings per mile; in July, however, they had an *increase* of $76,577; in June an increase of $224,534.

The Pacific and Far Western roads, five in number, report:

	1885.	1884.	Inc. or Dec.	P.c.
Miles	8,810	8,570	+ 240	2.8
Earnings	$4,678,788	$4,716,363	— $37,575	0.8
Earnings per mile	531	550	— 19	3.5

Only the Atchison, Topeka & Santa Fe has a decrease, but this is large. The two Denver roads have large gains; the Union Pacific a small one.

The same five roads had a decrease of $140,913 in August, $10,4·5 in July, and an *increase* of $296,201 in June.

West and southwest of St. Louis eight roads report:

	1885.	1884.	Inc. or Dec.	P.c.
Miles	3,289	3,157	+ 132	4.1
Earnings	$1,194,507	$1,181,669	+ $12,838	1.1
Earnings per mile	363	374	— 11	2.9

The larger part of the mileage in this territory does not report. The Fort Worth & Denver and the St. Louis & San Francisco alone show a decrease in total earnings.

These eight roads had a decrease of $60,433 in August, an *increase* of $6,557 in July, and a decrease of $19,377 in June.

In the territory east of Chicago and St. Louis, west of Pennsylvania and north of the Ohio, 16 roads report:

	1885.	1884.	Decrease	P. c.
Miles	7,480	7,480	.....	
Earnings	$3,811,800	$4,040,087	$228,287	5 6
Earn. per mile	530	540	30	5.6

Nine of the 16 roads have an increase in total earnings this year and also in earnings per mile, there being no change in mileage. The larger gains were 7½ by the Eastern Illinois, 27½ by the Ohio Southern and 17 by the Belleville line of the Alton & Terre Haute.

The same 16 roads reported an aggregate decrease of $436,584 in August, and of $507,577 in July.

Of the Southern railroads, 23 report:

	1885.	1884.	Increase.	P. c.
Miles	11,153	11,001	152	1.4
Earnings	$4,552,355	$4,477,901	$74,454	1.6
Earn. per mile	408	407	1	0.2

Thus there is a slight gain in the South. About half the roads show gains, the largest being by four of the roads in the Richmond & Danville system, by the Chesapeake, Ohio & Southwestern, and by the New Orleans & Northeastern.

These 23 roads in August had a decrease of $115,821, and the 19 of them reporting for July had an *increase* of $7,616 then, against a decrease of $61,602 in September.

The 14 Eastern roads report:

	1885.	1884.	Inc. or Dec.	P.c.
Miles	9,816	9,675	+ 141	1.5
Earnings	$10,494,417	$10,835,983	— $341,566	3.2
Earn. per mile	1,069	1,120	— 51	4.6

Seven of the 11 roads have some increase in earnings per mile—large only in the case of the New York & New England. The decreases are chiefly by the great roads.

In August, these 14 roads had a decrease of $1,435,629, instead of $341,566, as in September; in July, 13 of these had a decrease of $846,163, but in June their decrease was but $156,861, or much less than in September. Below we give earnings per mile in September for six successive years for as many roads as the figures are attainable:

Earnings per Mile in September, 1880 to 1885.

	1880.	1881.	1882.	1883.	1884.	1885.
Ala. Great South	$214	$242	$268	$332	$329	$312
Atch., Top. & S. F	513	750	730	618	637	578
Boston Hoosac T. & W.	....	....	....	400	537	515
Burl., C. R. & North	365	393	405	365	366	303
Canadian Pacific	....	....	278	256	256	295
Central Iowa	464	474	389	231	298	285
Charlotte, Col. & Aug.	278	233	209	211	174	217
Chesapeake & Ohio	569	568	643	707	583	594
Chicago & Alton	913	922	1,074	1,100	1,079	887
Chicago & E. Ill.	599	686	683	617	611	657
Chicago & N. W.	783	793	756	709	624	620
Chicago & W. Mich.	306	341	354	346	302	272
Chic., Burl. & Quincy	714	714	677	891	794	754
Chic., Mil. & St. Paul	404	433	445	488	458	461
Chic., St. P., M. & Om.	367	389	502	428	406	434
Cin., Ind., St. L. & Chic.	747	666	777	731	726	642
Cin., N. O. & Tex. Pac.	. .	. .	724	714	723	718
Cin., Wash. & Balt.	. .	. .	711	757	662	538
Cleve., Akron & Col	267	279	349	376	323	333
Columbia & Greenville	. .	. .	313	219	173	214
Denver & Rio Grande	741	612	513	431	396	427
Des Moines & Ft. Dodge	399	506	227	291	303	295
Det., Lansing & Nor	509	542	617	600	463	471
E. Tenn., Va. & Ga.	314	329	355	359	336	345
Eliz., Lex. & Big Sandy	. .	. .	441	638	583	504
Evansville & Terre H	. .	487	480	459	475	484
Flint & Pere Marquette	459	488	540	590	476	463
Fla. Ry. & Nav.	. .	133	162	157	121	120
Ft. Worth & Denver	. .	. .	. .	385	364	276
Grand Trunk	. .	. .	640	595	498	436
Gulf, Col. & S. F	. .	. .	453	426	346	384
Ill. Cen., Ill. lines	685	704	713	746	620	636
Ill. Cen., Iowa lines	442	454	481	502	414	392
Ill. Cen., So. Div	496	592	491	581	562	431
Ind., Bloom. & West	455	447	393	421	461	456
K. C., Ft. Scott & Gulf	341	464	445	501	493	540
Kentucky Central	. .	. .	503	414	400	357
Long Island	. .	638	756	809	885	891
Louisville & Nashville	506	517	550	646	555	589
Marquette, H. & Ont.	1,183	1,531	1,562	1,288	745	732
Memphis & Charleston	. .	. .	. .	347	378	360
Milwaukee & Northern	. .	. .	. .	211	204	206
Mil., Lake Shore & W.	. .	260	302	301	254	283
Mobile & Ohio	364	416	299	352	305	304
Nash., Chat. & St. L	369	517	353	357	367	333
N. Y. & New England	857	841	958	896	704	803
N. Y., L. Erie & W.	....	. .	. .	. .	. .	. .
N. Y., Pa. & Ohio	....	. .	. .	. .	. .	. .
N. Y., Susq. & West	....	....	....	617	649	717
Norfolk & Western	489	517	544	571	537	522
Northern Central	1,424	1,318	1,732	1,695	1,481	1,568
Northern Pacific	458	550	596	505	508	455
Ohio & Mississippi	....	. .	760	809	581	560
Ohio Southern	....	. .	279	298	357	454
Pennsylvania	1,940	1,940	2,231	2,239	2,045	1,851
Peoria, Dec. & Ev	225	283	258	286	294	310
Phila & Reading	2,470	1,954	2,031	2,137	1,844	1,795
Richmond & Danville	439	432	450	479	446	493
Rochester & Pittsburgh	. .	. .	301	283	371	394
St. Louis, Alton & T. H.:						
Main Line	701	667	672	727	581	583
Belleville Line	559	549	602	585	451	526
St. Louis & San Fran.	470	433	510	502	597	496
St L., Ft. Scott & W.	. .	. .	. .	202	296	294
St. Paul & Duluth	311	372	613	629	670	760
St. Paul, Minn. & Man.	418	561	786	576	528	504
South Carolina	579	476	419	538	444	459
Vicksburg & Meridian	. .	. .	244	320	292	260
Vicks., Shreve. & Pac.	. .	. .	. .	266	209	235
Virginia Midland	. .	. .	462	527	483	475
Wabash	565	488	491	493	580	502
Western N. Carolina	. .	. .	143	231	156	167
West Jersey	. .	631	597	590	605	626
Wisconsin Central	. .	188	212	272	256	267

Here we find the earnings per mile in September:

Of 36 out of 71 roads were less in 1885 than in 1884.
Of 46 " 71 " " " " " 1883.
Of 41 " 64 " " " " " 1882.
Of 30 " 50 " " " " " 1881
Of 25 " 45 " " " " " 1880.

Very nearly half of the roads had gains this year over last; but only 33 per cent. had gains over 1883, and the comparison with all the other years is more unfavorable than the comparison with last year, when September was a very unfavorable month. But September this year compared very favorably with August when 54 out of 71 roads had smaller earnings than in 1884, and 62 out of 71 smaller ones than in 1883.

The companies with larger earnings per mile this year than in any previous year reported upon are the Canadian Pacific, the Ft. Scott & Gulf, the Long Island, the New York, Susquehanna & Western, the Ohio Southern, the Peoria, Decatur & Evansville, the Richmond & Danville, Rochester & Pittsburgh and the St. Paul & Duluth; those with *smaller* earnings per mile this year than in any previous year here given are the Burlington, Cedar Rapids & Northern, the Chicago & Alton, the Chicago & Northwestern, the Chicago & West Michigan, the Cincinnati, Indianapolis, St. Louis & Chicago, the Cincinnati, Washington & Baltimore, the Florida Navigation Co., the Grand Trunk, the Iowa lines and the Southern Division of the Illinois Central, the Kentucky Central, the Marquette & Ontonagon, the Nashville, Chattanooga & St. Louis, the Northern Pacific, the Ohio & Mississippi, the Pennsylvania, the Reading, and the West Jersey.

It is of course true that earnings per mile are not alone sufficient to show the financial prosperity of a company; in most cases where mileage has been increased by construction, the additions to capital are less in proportion than the additions to mileage. When the Northwestern or the Milwaukee & St. Paul builds a new line and pays for it by an issue of $15,000 per mile of 5 per cent. bonds without any increase of share capital, the new line need not earn half as much as the average of the old ones, and yet add to, instead of decreasing, the profits available for dividend. But when great additions to mileage have been made in a very short time, a simple statement of total earnings is scarcely of any value at all, and a statement of earnings per mile often shows that an enormous gain in total earnings is not due to a wonderful increase in prosperity; while an increase in earnings per mile is generally sound evidence of improvement. The changes of mileage since last year are not so great as for some years previously, and therefore changes in both total earnings and earnings per mile represent better than usual changes in the available income.

OCTOBER EARNINGS.

Last week we had October earnings from only three railroads, all showing a great improvement compared with previous months. We have now reports from 32, and their aggregate earnings were:

	1885.	1884.	Increase.	P. c.
32 railroads	$18,112,405	$16,979,047	$1,133,168	6.7

It has been so long since any considerable group of railroads has shown any increase in aggregate earnings that this large increase of 32 railroads, whose earnings are usually about half as great as those of the entire 70 reporting outside of the Eastern states, seems amazing. And the improvement is general. Only nine of these 32 roads had any decrease in earnings in October, while of the 31 of them that reported for September 13 had a decrease, and the aggregate net increase of the 31 was $351,686 then, against $1,126,405 in October. Yet September was notable for the improvement shown compared with previous months of this year.

Of the railroads northwest of St. Paul the Oregon Railway & Navigation Co. makes the best showing—really an extraordinary gain, made with but small in-

crease in mileage, namely, an increase of $172,500 (35½ per cent.) in gross earnings, and an increase of $117,000 (45 per cent.) in net earnings. The crop of wheat in Eastern Oregon and Washington this year is said to have averaged fully 30 bushels to the acre, and though there was but little immigration during the past year, the area under cultivation was about 4 per cent greater than in 1884. Nearly all this immense production goes all the way to Liverpool, and the Oregon Company hauls most of it from the stations near the farms to Portland by rail, and thence takes the larger part to San Francisco by steamers, so that it has the carriage of it for about 900 miles.

The Northern Pacific, which had shown a decrease for several months previous, in October had an increase of $60,370, or 4½ per cent., though the October earnings last year were the largest in the history of the company. For five years its earnings in October have been :

1881.	1882.	1883.	1884.	1885.
$570,724	$824,769	$1,397,222	$1,461,511	$1,521,881

October in 1883 was the first month the road was open through.

The St. Paul & Manitoba shows a slight decrease (1½ per cent.) from last year, but its earnings were extraordinary in October last year, larger than in any other month of its history, and next to them stand the earnings of the month this year. In every other month of this year except January and September this company has had a decrease in earnings, and generally it has been much larger than last month. For five years its earnings in October have been :

1881.	1882.	1883.	1884.	1885.
$605,708	$979,057	$916,882	$1,014,862	$998,858

The Canadian Pacific probably makes the larger part of its earnings east of Lake Superior, and the increase in its mileage is such as to give little significance to the increase in earnings, and as they were but $340 per mile this year, they are still very light. As, however, several hundred miles of the road were scarcely worked at all in October, this, too, is somewhat deceptive, though it may be claimed that the working of the line north of Lake Superior is likely to add to the expenses more than to the earnings.

The St. Paul & Duluth has shown almost continuous gains throughout the year, so that one is not surprised to find an increase of more than 9 per cent. in October. Still its gain then was nearly one-half greater than in September, and its October earnings for five years have been :

1881.	1882.	1883.	1884.	1885.
$73,688	$146,023	$162,919	$166,633	$181,993

The mileage has been increased but little, but the importance of the traffic has increased immensely with the growth of Lake Superior traffic.

All these railroads, except, perhaps, the Oregon system, included here for convenience, have their harvest in the fall months, and October is almost always their best month. The close of navigation on Lake Superior has a much greater effect on them, and is always likely to have, than the close of lake navigation on the lines to Chicago and Milwaukee, for the very good reason that it increases by a much larger amount the cost of shipping to market the produce of the country on their lines. The close of navigation makes the producer on the Chicago road pay the Chicago-New York rail rate instead of the lake and canal rate, but it makes the one northwest of St. Paul pay the same, and in addition the rail rate from St. Paul to Chicago, which is equal to 10½ cents a bushel on wheat, against which may be set the amount the lake freight from Duluth is higher than from Chicago, which this year has been from 1 to 1½ cents a bushel. Thus, the farmers west of Lake Superior have a much stronger motive for hurrying forward their grain before navigation closes in the fall, or, failing that, for holding it until navigation opens in the spring, than the farmers west and southwest of Chicago.

Of the railroads northwest and west of Chicago, the Chicago, Milwaukee & St. Paul has earned in October, as we noted last week :

1881.	1882.	1883.	1884.	1885.
$1,591,053	$2,250,975	$2,531,128	$2,539,796	$2,892,000

The increase over last year and the year before is 13¾ per cent., and the earnings are the largest the road has ever had in any month of any year, October being usually the month of its largest earnings. Its gain last September was $71,760 ; in October, $352,205.

Meanwhile, the Chicago & Northwestern earned :

1881.	1882.	1883.	1884.	1885.
$2,341,097	$2,601,445	$2,793,991	$2,523,843	$2 793,600

This year the earnings were 10¾ per cent. more than last year, but the same as in 1883, and only 7¼ per cent. more than in 1882. But in September this road gained only $36,400 over last year, against the gain of $269,757 in October. In August it had a decrease of nearly $100,000, so that the improvement is very great indeed.

Its controlled road, the St. Paul & Omaha, has earned in October:

1881.	1882.	1883.	1884.	1885.
$579,029	$548,852	$673,880	$642,460	$695,900

The increase this year over 1884 is 8¼ per cent.; over 1883, 3⅛ per cent. In August it gained $6,270 over last year, and in September $44,500, against $53,400 in October. For the eight months ending with August it had a decrease of $168,356, which the gains of the last two months have reduced to $70,456. Perhaps no other road gains so much by the greater activity in the lumber business.

Three lumber roads in Northern Wisconsin show gains in October not very different from their September gains—the Wisconsin Central, $3,179 in October against $4,637 in September ; the Milwaukee, Lake Shore & Western, $54,189 against $4,409 ; the Milwaukee & Northern (not so much of a lumber road) $869 against $537. The Burlington, Cedar Rapids & Northern gained $68,059 in October against $38,813 in September, and an average of $21,553 in the eight previous months of the year. The increase of its mileage has been so great that its earnings in different years are not very significant, but they have been in October :

1881.	1882.	1883.	1884.	1885.
$221,748	$300,155	$307,640	$281,443	$349,502

Thus, in 1883, when it had but 714 miles of road, it earned but $41,862 less than this year, when it has 990 miles, the earnings per mile falling from $430 to $353 ; but this is an improvement over previous months of this year. This road, like most as far north, usually has its largest earnings in October.

The Iowa lines of the Illinois Central, unlike all the above, make a *worse* showing in October than in the two months previous, suffering a decrease of $16,849 then, against a decrease of $9,235 in September, $12,943 in August, and an average of $7,170 in the other seven months of the year. Nothing seems to help this line. Its October earnings have been :

1879.	1880.	1881.	1882.	1883.	1884.	1885.
$181,910	$185,033	$169,048	$204,603	$210,842	$181,867	$163,018

Thus its earnings this year were less than in any of the six years previous.

The Illinois lines and the Southern Division have not been reported separately yet. The aggregate earnings of the two in October have been :

1881.	1882.	1883.	1884.	1885.
$1,059,467	$1,106,852	$1,183,468	$1,078,544	$1,082,735

There is a small gain over last year, but a decrease of 8½ per cent. from 1883 and of 2¼ per cent. from 1882. Still there is an improvement over some previous months, for instead of the gain of $4,191 in October over last year, there was a decrease of $3,377 in September, and a decrease of $15,647 in August.

The Central Iowa does not share the general improvement, having a decrease of $6,219 in October, against one of $6,332 in September and $7,013 in August, which, however, is better than in previous months, the average decrease for the seven months ending with July having been $18,888 per month.

So much further south as to have a quite different traffic, which usually culminates in September instead of October, is the Chicago & Alton, which did not do well in October, yet lost less then than in September —$141,897, against $162,672. Indeed, its October earnings were but $7,149 less than in September, while for three years previous they were $28,000 to $54,000 less. Its October earnings have been :

1881.	1882.	1883.	1884.	1885.
$771,844	$858,674	$901,619	$989,037	$747,140

Thus the earnings this year were smaller than in any other of the five, and the decrease from 1883 is 17 per cent. It has had large decreases throughout this year, but chiefly since June, there having been a decrease of $255,386 for the six months then ending, and one of $509,970 for the following four months. It does not clearly appear why this road should be suffering so much more than its nearest neighbors.

The only roads reporting southwest of St. Louis are the St. Louis & San Francisco, whose decrease was $12,900 in October, against $55,900 in September, $74,228 in August, and $33,997 in July ; and the Gulf, Colorado & Santa Fe, which made the enormous gain of $78,950 (38 per cent.) in October, against $25,777 in September, $15,297 in August, $8,989 in July, and an average *decrease* of $27,265 per month in the previous six months. Its October earnings have been :

1881.	1882.	1883.	1884.	1885.
$127,427	$227,506	$263,436	$211,061	$290,011

The gain over 1883 is only 10 per cent., so that most of the great gain this year only made up for a great loss last year. This is now the most important Texas cotton road that reports, and it is probable that the other Texas roads are also making great gains over last year, when two successive very bad cotton crops had greatly reduced traffic.

In the territory north of the Ohio we have reports from two roads which have some but not an important share of the trunk line through traffic, namely, the Indiana, Bloomington & Western, whose October earnings have been :

1881.	1882.	1883.	1884.	1885.
$228,677	$281,140	$270,941	$224,500	$227,116

The earnings of the leased Indianapolis, Decatur & Springfield are included in 1882 and 1883, and they were about $35,600 in 1884, when they are *not* included. It appears from this that, though there was this year a slight gain over last year, there was a decrease compared with previous years. The gain of $2,616 in October was an improvement over the loss of $2,759 in September, but not over the gain of $13 949 in August.

The other line with some trunk line traffic is the Cincinnati, Indianapolis, St. Louis & Chicago, whose earnings in October have been :

1881.	1882	1883.	1884.	1885.
$221,320	$249,443	$249,507	$241,145	$219,316

The decrease from last year is 9 per cent., and from the two previous years 12 per cent. Compared with last year the decrease was $21,829 in October, $28,793 in September, $44,583 in August, and $38,593 in July, so that there has been a decided improvement.

Another road in this general territory is the Chicago & Eastern Illinois, which has earned in October :

1881.	1882.	1883.	1884.	1883
$156,857	$176,305	$145,021	$156,567	$154,215

Thus, the earnings this year were less than in any other of the five except 1883, and there was a decrease of $2,352 from last year, against an increase of $11,632 in September, a decrease of $4,015 in August, and a decrease of $15,687 in July.

The Chicago & West Michigan, which lives very largely on lumber, earned in October :

1881.	1882.	1883.	1884.	1885.
$123,010	$131,063	$142,134	$128,035	$124,640

Thus the earnings were less this year than in any other since 1881, but the decrease from last year in October was but $3,395, against $11,967 in September, $18,855 in August, and an average of $24,925 in the other seven months of the year.

The Flint & Pere Marquette is another Michigan lumber road, but it should also profit largely by the excellent wheat crop of that state. It has earned in October :

1881.	1882	1883.	1884.	1885.
$166,380	$199,067	$257,779	$186,945	$188,735

The gain of $1,790 over last year is small, but it is better than the loss of $4,573 in September, of $18,570 in August, of $21,383 in July, and the average decrease of $47,372 in the previous six months of this year.

The Detroit, Lansing & Northern is less a lumber road, probably, but more a wheat road than the Flint & Pere Marquette. It has earned in October :

1881.	1882.	1883.	1884.	1885.
$130,942	$149,570	$169,780	$133,110	$135,245

There was a gain of $2,135 in October, a gain of $6,602 in September, a loss of $11,496 in August, and an average loss of $18,500 per month in the seven months previous.

In the Far West the Denver & Rio Grande's October earnings have been :

1881.	1882.	1883.	1884.	1885.
$665,687	$642,213	$720,445	$567,285	$639,049

The gain over last year is $71,764, against $39,936 in September, $98,305 in August, and an average of $49,843 per month for the seven months previous.

In the South the Mobile & Ohio earned :

1881.	1882.	1883.	1884.	1885.
$256,924	$267,433	$256,271	$212,450	$225,243

Thus the earnings, though 6 per cent. more than last year, were more than 10 per cent. less than in the other three years. Against the gain of $12,784 in October, there was a loss of $4,346 in September, of $10,799 in August, and of $11,030 in July.

The Louisville and Nashville earned in October :

1881.	1882.	1883.	1884.	1885
$1,002,950	$1,215,932	$1,504,465	$1,291,714	$1,244,911

This road's decrease from last year was $46,803 in October, $25,324 in September, $39,826 in August and $2,772 in July.

Another Southern road, the Norfolk & Western, reports a loss of but $904 in October, against $2,637 in September, a gain of $21,996 in August, and one of $24,443 in July.

In the East, as we showed last week, the Long Island Railroad made a larger gain than in previous months, and this week we have the Rochester & Pittsburgh gaining $1,976 in October, against $6,806 in September, while it had a decrease of $4,881 in August.

Thus, in all but a few cases the railroads have larger gains or smaller losses in October than in any other recent month, and the improvement since August is very marked.

October was not a favorable month last year, but the decrease then was not greater than in several months of the year, as September, August, June and

March. In many cases large gains over last year leave the earnings less than in 1883, but the great fact is that the course of earnings has turned upward.

TRACK INSPECTIONS AND PREMIUMS.

The system of track inspection on the Savannah, Florida & Western and Charleston & Savannah Railways, the report of which, for the second year in which the system has been established, has reached us, is quite elaborate, and seems a very good one. Both annual and quarterly inspections are held; the first by the higher officers and engineers and the latter by officers of the road department. Every mile and every section is marked separately in respect to (1) line, (2) surface, (3) level, (4) frogs and switches, (5) drainage, (6) policing, the range of each being from 0 to 10. A committee of two is appointed to inspect and mark each one of these details, and that one only which ought to give a much fairer basis of comparison than when every detail is marked by every inspecting officer, and every division or section is judged in the aggregate. The section foreman can then determine at once just what defects were considered to exist and at what points.

Premiums are awarded from the annual inspection of $100 to the supervisor of the best division, and $50 to two others, and $40 and $20 to the first and second best sections of each division. The section-foremen are also classified as first, second and third-class foremen, according as their mark is over eight, over six or under six. At the quarterly inspection the section-foreman showing the most improvement on each division is awarded $15, and the one having the smallest labor account without deterioration in the condition of his section, $10. If the section has previously had a low mark, some improvement of condition is required to obtain this award. An award of $10 is also made for the most progress in bringing road-bed up to standard, and $10 for the least expense for tools per man.

The system in use on many roads, if not on most roads which have an inspection at all, is far less perfect than this. It is not uncommon for a certain number of officers to make a trip over the line and each mark all the details, and from the very nature of this system it is then impossible to judge each mile or section separately, since no one man can mark so many different details so frequently, especially if the trip is made, as it often is, at high passenger speed. There is, therefore, nothing specific in the markings, nothing to indicate just where and why the condition of track was deemed good or bad. Each inspector, after riding thirty or forty or fifty miles, has nothing more than a vague remembrance of perhaps widely diverse conditions, and the disadvantage of this should fairly outweigh the advantage of having a larger number of marks to average.

An intermediate system is that in vogue on the Pennsylvania road, which was in part described and illustrated in our issue of Feb. 2, 1877, and has not, to our knowledge, been essentially modified since. Each of the three general divisions is divided into divisions of about 100 miles, and these again into supervisors' divisions of 20 to 40 miles, and three or four sections of about 2½ miles. Special inspection cars, open in front with rising seats, are used, each pushed from behind by a separate locomotive, so as to give unobstructed view of the track. A run is first made in ordinary cars from New York to Pittsburgh at about 40 miles per hour, in which the line and surface of each section is marked, as indicated by the riding of the cars, and the return trip is then made in the open cars described at 10 to 12 miles per hour, running by daylight only, so that the trip takes three or four days.

As many as 100 persons have taken part in these inspection trips, divided into four committees, marking in the aggregate the following eleven details, each on a scale of 1 to 10, and each sub-division of 2½ miles being marked separately.

Committee No. 1 mark line, surfacing; Committee No. 2 mark joints, spacing ties; Committee No. 3 mark ballast, switches, sidings; Committee No. 4 mark ditches, road crossings, station grounds, policing.

This system is perhaps quite as detailed as is feasible for a long road. The premiums awarded are: General Manager's premiums of $100 and $50 for the best subdivisions between New York and Pittsburgh, the same premiums from the General Superintendent of each division for the best and second best supervisor's divisions on each general division, and Division Superintendent's premiums for the best sections in each division.

Any system of track inspection whatever, it may be safely assumed, with or without premiums, will be better than none, and the road which fails to establish any system at all omits to do what many thousands of dollars spent directly on the track will not make up for. It has been objected to the awarding of premiums in this way that it may engender jealousy and bad feeling, and that "a man ought to do his duty anyway." Perhaps he ought, and perhaps in a certain sense he does, but "duty" is a very elastic and indefinite term, and if it be given its fullest sense of doing all that the mind can conceive of as possibly useful in the position which he holds, it is quite certain that very many men fall far below their "duty" without some special stimulus to keep them up to it. Four-o'clock-in-the-morning duty, like four-o'clock-in-the-morning courage, is a rare quality, but it is the quality which is wanted for the highest efficiency in any department of railroad service, or any other service, and should be encouraged in every way.

Nothing, in fact, has been better established by experience than that, among a number of men engaged in doing the same thing, and (we may admit) all meaning in a general way to do their duty faithfully, there will be great differences, not only in their natural capacity, but in their ideas of what constitutes doing their duty. Some have such a high idea of this, or so much natural energy, as to be always keenly alive to watch every detail of their work. Others, we all know, are in literal truth not only "born tired" but born blind. They do what lies before them faithfully—more or less so—but they do not see the things to do which are on every side of them a little out of the beaten path. This difference of disposition tells greatly on the results of their work, and equity requires that if there be any way by which a difference *in results* can be recognized by an additional compensation, it should be done. To justify a contrary view we must assert (1) that out of a dozen or twenty men all are equally anxious and equally zealous in doing what they regard as their duty (which surely would be an absurd claim), and (2) that men doing the same thing and equally careful to do their duty should receive the same compensation because of the mere fact of equal care, whether the *results* of their efforts are as good as others or not.

There is a special reason why track inspections and the giving of premiums depending on comparative marking at such inspections are desirable: the absolute want of any other accurate method of measuring efficiency by results. Maintenance of locomotives and cars is—not perhaps in a single year, but in the aggregate of several years—a tolerably definite and positive thing. If the rolling stock is not kept up, the fact is sure to become evident; and if it is kept up to a certain average standard, that is all that is required. But track is never perfect, and the more nearly it approaches it the more costly it becomes to make it a little more perfect yet. Consequently, it is very difficult to check the expenditure by results, and to measure correctly the efficiency of different men. The only effectual way of doing this is by periodic inspection trips to determine as closely as may be progress or deterioration; and the fairest way of making such inspections is to mark every detail in every mile, both as locating the defects which require improvement and as enabling all concerned to determine the existence of the alleged defects. It is the universal testimony of all who have tried the plan, so far as we know, that track inspections are very effectual in raising the standard and increasing the efficiency of track work, and it would be well if all railroads should imitate the example which is now set them by so many lines.

The Movement of Merchandise to the West.

The through shipments from New York by the trunk lines in October were larger this year than ever before, except in 1881 and 1882, having been, since the records have been kept:

Year.	Tons.	Year.	Tons.
1877	77,890	1882	118,840
1878	67,309	1883	91,448
1879	86,091	1884	92,254
1880	86,858	1885	117,191
1881	142,474		

The increase over last year is 27 per cent. In 1883 the shipments by the Lackawanna were not included, and they may have amounted to 17,000 tons, mostly low-class freight; but allowing for this there was an increase this year of more than 9 per cent. The shipments were but slightly less than in 1882, but were 25,283 tons (16 per cent.) less than in 1881, when great quantities of imported iron were going forward at rates which diverted it from the canal.

The advance of rates Oct. 5 last might have been expected to give the canal boats an opportunity to get some of the low-class freight; really the shipments of the first four days of the month were at the rate of 5,754 tons per day, of the days since the advance at the rate of 3,488 tons per day, the shipments in the first period having, of course, been greatly stimulated by the announcement of the advance (they would have made the month's shipments more than 178,000 tons); but the shipments since have been much above last year's average, when they were at the rate of 2,870 tons per day, against 3,488 this year.

Moreover, the shipments have been very uniform since the advance this year, varying only between 23,057 and 23,858 tons per week, and largest in the last week, while last year the shipments decreased from week to week, and were much less in the last week than in the first two.

Very likely, however, one cause of the large shipments this year was the filling of time contracts, under which freight may have been forwarded the faster because they were soon to expire. Certain it is that the October as well as the September shipments were remarkably large. The change in comparison with previous months is shown in the following table of the New York shipments in each of the last ten months since 1880:

	1881.	1882.	1883.	1884.	1885.
January	79,402	109,742	81,227	94,696	81,775
February	81,375	120 089	78,737	96,940	84,768
March	106,673	167,615	102,699	108,436	107,032
April	99,057	161,492	86,007	108,632	104,722
May	83,970	135,030	80,284	98,352	99,154
June	85,943	126,600	80,556	88,069	101,595
July	73,114	79,464	81,959	92,222	102,397
August	120,886	115,862	96,991	101 040	106,447
September	141,174	115,156	92,192	106,819	127,195
October	142,474	118,840	91,448	92,254	117,191
Ten months	1,094,069	1,249,890	872,100	987,460	1,033,276

In 1880 the shipments for the ten months, at well maintained rates, were 866,584 tons; in 1879, 657.210, and in 1878 629,039 tons. Thus the shipments this year were larger than in any other except 1882, but the earnings from them probably smaller than in any other except 1882, when the very low rates which prevailed this year from June 1 to Oct. 5 ruled throughout the first half of the year. The increase over last year is trifling in consideration of the great reduction of rates, and the whole of the increase has been made in the last two months. As previously, even under the June tariff, the increase had been much less (13,500 tons in June, 10,200 in July and 5,400 in August, against 20,400 in September and 24,900 in October), we may be sure that the gain this fall has been largely due to better business and only partly to lower rates, and there is good reason to believe that there will continue to be an increase in business after the advance to take place next week.

The trunk line presidents at their meeting last week adopted the plan for maintaining rates submitted by the Trunk Line Executive Committee—that is, Mr. Fink's plan with slight changes—and the Executive Committee has this week been at work under it, having gone over the passenger scheme Tuesday, and expecting to begin on the freight plan Thursday. All the pools under this plan have yet to be formed; but they will doubtless date back to the adoption of the plan, and provision is made for arbitration, so that there is all the motive for maintaining rates that there would be if the divisions were made, as no one can tell but what he will have to pay at full rates for an excess of traffic carried, and no one will like to pay back more than he received for carrying the business.

East-bound rates are to be advanced Nov. 23 to the basis of 25 cents per 100 lbs. from Chicago to New York for grain and flour, and 30 cents for provisions and live hogs—an advance of five cents, making the rates the same as the rate nominally in force last winter, which, however, was adopted in midsummer (July 20) and was much better maintained in the summer and fall than in the winter. It is probable that this tariff of Nov. 23 will be the winter rate, and that no one expects to be able to get more than that. It may be better than a higher rate for grain, but it seems as if more than 30 cents could be had for carrying provisions.

Notice is given of an advance in west-bound rates Nov. 18 to what may be called the standard basis—being substantially the rates that have ruled, except when interrupted by railroad wars, since 1880. The rates that have been formally announced this year have been, from New York to Chicago, in cents per 100 lbs.:

	Class				
	1.	2.	3.	4.	5.
Jan	50	40	30	25	18
June 1	40	30	25	18	15
Oct. 5	60	50	40	25	20
Nov. 18	75	60	45	35	25

Even when rates were lowest some of the companies were carrying for less than the tariff, and had time contracts which have now, it is understood, been filled, or so nearly so that it will be possible to maintain the standard tariff.

The difference between the new tariff and that

which ruled in the summer makes a difference of something like $500,000 per month in the *profits* of the trunk lines and their western connections.

The shipments from the seaboard cities and certain New England points under this tariff were 1,922,000 tons in 1884, when they were the smallest for four years, which at the standard tariff would have yielded about $16,000,000 had it all gone as far as Chicago. Besides this, large shipments from interior points in the East are made at rates which vary substantially with the New York-Chicago rate.

As we have shown heretofore, the shipments of west-bound freight are not much more, except in the lowest classes, at the lowest that at the standard rates. There is thus reason for expecting a material addition to the incomes of several railroads, especially of the trunk lines, from the new tariff.

The Indian wheat-growers are helped to compete for the supply of the European market by very low ocean rates, recent quotations being at the rate of 16 cents a bushel from Calcutta by steam, and 12 cents from Bombay, and they have been about one-third lower. The distance is more than twice as great from Bombay (*via* Suez Canal) as from New York; the present rates about four times as great; but formerly the difference was much greater in favor of New York. For about a year and a half the railroads from the interior wheat districts in India to the seaports have given rates on wheat about equivalent to 32 cents per 100 lbs. from Chicago to New York; there are no such long hauls to the Indian "trunk lines" on which these low rates are made as there are in this country west of Chicago; but there are not many railroads of any kind, and very poor highways, so that the cost of transportation from the field to the sea is probably usually greater than in this country from Kansas or Dakota, by rail; the current rate from St. Paul to New York is 35 cents per 100 lbs. By lake and canal it is much less—from Duluth to New York about 19 cents now just before the close of navigation, while during most of the season past it was not more than 13 cents. Thus, our producers still have an enormous advantage over the Hindoos in the cost of transporting their wheat to the European market, and the latter are able to compete only by accepting prices which no one would grow wheat for in this country.

It may be urged that, as the cost of transportation from India is still much higher in proportion to distance than the cost here, a reduction to a level with our rates is likely to give India the whole trade; but it must be considered that India is not a new, thinly peopled country, with a vast area of land waiting to be brought under cultivation, but an old and densely peopled country (average population about 165 per square mile; while New York has 107, New Jersey 162, Pennsylvania 95, Connecticut 129) in which the population always presses close on the means of subsistence, so much so that that the largest exports so far have been but 0.2 bushel of wheat per inhabitant, while our exports of wheat are usually more than two bushels, and sometimes more than three bushels per inhabitant. A very slight change in the population or industries or mode of living in India would cause it to require its entire production. A rate of increase in population in India for less than two years such as we have here would require more grain than the Indian exports have ever been in one year.

Duluth is making good its claim to be a leading wheat market. For the month of September it received more wheat than both of the other spring wheat markets together, as follows, in bushels:

Chicago.	Milwaukee.	Chic. & Mil.	Duluth.
3,615,997	1,518,307	5,134,304	5,292,577

It is true that Duluth has a short season. It does not begin to have important receipts until September, and ceases having them when navigation closes, though last year it had a respectable wheat business throughout the year. Thus, its receipts for any one year are likely to be less than those of several other markets which it far surpasses in the fall months.

Chicago, Burlington & Quincy Earnings and Expenses in September.

The Chicago, Burlington & Quincy earnings in September show a decrease of 2½ per cent. in gross and of 5½ per cent. in net earnings, yet considering the circumstances of the two years and the kind of traffic showing a decrease, the report is really very favorable this year.

The mileage, gross and net earnings and working expenses of the road in September for the last six years have been:

Year.	Miles.	Gross earnings.	Expenses.	Net earnings.
1880	2,712	$1,862,284	$837,452	$1,024,832
1881	3,168	2,262,981	1,017,328	1,245,653
1882	3,228	2,186,400	954,563	1,231,837
1883	3,264	2,909,165	1,329,613	1,579,552
1884	3,467	2,707,110	1,121,786	1,585,324
1885	3,572	2,640,035	1,143,203	1,496,832

The decrease from 1883 is 9 per cent. in gross and 5¼ per cent. in net earnings, notwithstanding an increase of 10 per cent. in mileage meanwhile, but the earnings this year were much larger than in any previous to 1883, when this road had larger earnings than ever before or since in any month of any year.

It is in comparing the earnings from different sources that we find this year's returns satisfactory. These earnings have been:

	1885.	1884.	1883.
Passenger	$612,298	$557,098	$598,770
Freight	1,881,417	1,988,199	2,216 578
Other	146,320	161,813	93,817

Thus, compared with last year, there has been an increase of $55,200, or nearly 10 per cent., in passenger earnings, making them larger than in 1883 even. This we are inclined to think more important than the decrease of 5 per cent. in freight earnings, especially as the latter were artificially stimulated last year, namely, by the corner in corn at Chicago which culminated Sept. 30 last year, and which caused the price to go up to something like a dollar a bushel, and so drew out nearly every bushel that could be got to Chicago in time. Most of the corn available was on the Chicago, Burlington & Quincy Railroad, and its rolling stock was fully employed hauling it in the last half of the month. This year there was no such corn movement, and the wheat movement was also heavy last year, though naturally so.

For the nine months ending with September the gross and net earnings and working expenses of this company have been for six years:

Year.	Gross earnings.	Expenses.	Net earnings.
1880	$15,129,853	$7,042.726	$8,087,127
1881	15,423,831	7,891,905	7,531,926
1882	15,053,879	8,069,752	6,984.127
1883	18,634,197	9 591,547	9,042,650
1884	18,505,825	9,789,722	8,716,103
1885	19,050,140	10,600,404	8.449,735

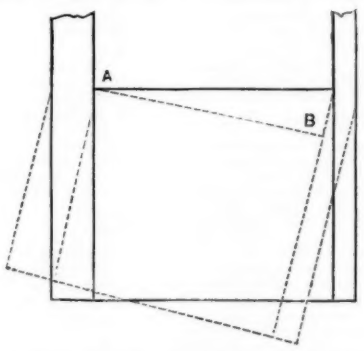
The gross earnings for the nine months this year were thus larger than ever before, and $544,314 (3 per cent.) more than last year, but the increase in working expenses was so much greater ($810,682=8¼ per cent.) that there was a decrease of $266,368 (3 per cent.) in net earnings. Since 1883 the decrease in net earnings is still larger—$592,915, or nearly 6 per cent.

The passenger earnings for the nine months show a decrease of $141,236, or 3½ per cent., while the freight earnings increased 4⅝ per cent., and the miscellaneous earnings increased 6 per cent. The passenger earnings have decreased every other month of this year except May, when the increase was very small.

The Deterioration of Boilers.

In an article in our last issue on this subject, we referred to cases where long locomotive fire-boxes had widened ⅝ in. in service, this bulging affecting both the mud-ring and the sides of the box. Mr. W. Stroudley, of the London & Brighton Railway, states: "We make our mud-rings 3 in. thick by 3½ in. vertical depth, the fire-box and outer shell being double riveted through the ring. The object of having the ring so deep is to prevent its turning by the depressing influence of the firebox, and so causing grooving in the outer shell, as happens when the ring is shallow."

The effect produced by the downward expansion of the fire-box side sheet is illustrated in the accompanying cut, the



amount of expansion being exaggerated in order to make the effect clear. The full lines show the mud-ring and fire-box sheets when cold, and the dotted lines show the alteration produced by the expansion of the inside fire-box. It will be seen that the outer shell hinges on the point *A*, bending the plate. A less severe bending action takes place at *B*, and both these tend to produce grooving.

The deformation of the mud-ring may be thus accounted for, and we can only suppose that the mud-ring once twisted out of shape, the plates composing the fire-box shell yield to the tendency to approximate to the spherical form natural to all hollow bodies under an internal pressure.

The report presented at the annual meeting of the stockholders of the Manhattan Company this week contains one statement which New Yorkers will be inclined to question. After giving the average number of passengers carried per day last year at 283,164, it says: "We are of the opinion that we can carry with safety at least 500,000 per diem with our present facilities." This might and probably would be true, if the travel were distributed evenly over all the lines, and through all the hours of the day. Such a distribution, however, is evidently impossible, for while some slight relief to the most crowded line—the Third avenue—might be obtained by drawing additional travel to the Second avenue line, it is evident that so long as the present conditions of life in the city continue, at least two-thirds and probably more of the passengers must be carried within six hours of the day, and that during the crowded hours most of them must be carried in one direction, the trains in the opposite direction running with very light loads. To any one who travels on the Third or the Sixth avenue line in commission hours, it is evident that the limi of comfort was passed long ago, and that that of safety is very nearly reached. The relief afforded by running five instead of four cars on some of the trains has been hardly perceptible; an increase in the present number of trains is no possible, and it is evident that, should the travel increase to anything like an average of 500,000 per day, under the present conditions, it would be simply impossible to carry the passengers in the busy hours without a very considerable addition to the present facilities. How this addition is to be made is the problem which the managers of the road have to solve.

Chicago through rail shipments eastward for the week to Nov. 7, only flour, grain and provisions being included this year and last, but freights of all kinds in previous years, have been as follows for the past six years, in tons:

1880.	1881.	1882.	1883.	1884.	1885.
53,269	51,949	43,682	43,723	47,580	27,586

Thus the shipments this year were 42 per cent. less than last year, and much less than in any other year reported—small without precedent for this season of the year.

The total shipments and the percentage going by each railroad in each of the last six weeks have been:

	Week ending.					
Tons:	Oct. 3.	Oct. 10.	Oct. 17.	Oct. 24.	Oct. 31.	Nov. 7.
Flour	6.052	10.350	6,952	4,412	3.644	3,915
Grain	44,776	36,288	27,157	14.628	15,259	14,680
Provisions	11,591	8,813	4.681	6,139	7,866	8.991
Total	62,419	55,460	38,790	25,179	26,769	27,586
Per cent.:						
C. & Grand T.	16.5	7.2	2.9	9.3	7.9	11.4
Mich. Cen.	23.3	23.0	32.5	17.7	21.6	18.4
Lake Shore	18.0	20.5	18.1	13.4	14.2	15.1
Nickel Plate	12.6	10.8	5.5	7.4	8.1	7.9
Ft. Wayne	11.2	17.9	21.6	29.2	19.8	21.0
C., St. L. & P.	7.7	10.3	10.0	12.0	13.1	11.4
Balt. & Ohio	7.7	7.1	4.9	6.0	8.1	7.4
Ch. & Atlantic	3.0	3.2	4.5	5.0	7.2	7 4
Total	100.0	100.0	100.0	100.0	100.0	100.0

Thus the increase last week over the week before and two weeks before was but trifling; compared with the last week of October, there was an increase of 14 per cent. in provisions and 7½ per cent. in flour, and a decrease of 4 per cent in grain. The provision shipments were the largest for five weeks, but with one exception the grain shipments were the smallest since the second week of August.

The very small shipments of the last three weeks have brought down the average of the shipments since August to about what has been usual at this season, while down to Oct. 10 they had been extraordinarily large. Thus for the 10 weeks ending Nov. 7 shipments have been:

1880.	1881.	1882.	1883.	1884.	1885.
404,215	585,113	322,574	400,820	405,778	426,299

Allowance must be made this year and last for the shipments of higher class freight; but unless there is an improvement soon, the total shipments of the three fall months are not likely to be much, if any, above the average, in spite the extraordinary shipments (272,958 tons) in the five weeks ending Oct. 10, when freight was carried for 10 and 12 cents per 100. The shipments for the last three weeks were not half as great as for the three weeks ending Oct. 12, when the low rates were having their greatest effect. The profit on them was doubtless much greater in the later period, and greater than the above figures indicate, because the fluctuations in the amount of high class freight, not reported here, are much less than in grain, etc.

In percentages, last week shows a distribution nearer tha average than there had been for some weeks, the Grand Trunk carrying more than before. The three Vanderbilt roads together had 41.4 per cent. of the whole; the two Pennsylvania roads, 32.4. The indications are that rates are well maintained.

The frequency with which officers who become at all prominent in railroad service are drawn from it by the superior opportunities of private business is again illustrated by the announcement in another column of the resignation of Mr. F. M. Wilder, Superintendent of Motive Power of the New York, Lake Erie & Western, to accept the position of General Superintendent of the Corliss Steam Engine Works, of Providence. Perhaps the instances of the kind are no more than occur in other pursuits, if they were as faithfully chronicled, but there certainly seems to be more of them than is altogether for the interests of the railroads, since their service is of a nature that, while it qualifies any one very well for positions in private establishments, yet it can hardly be itself entered to advantage by one who has not been brought up in it, except in the junior grades.

Mr. Wilder has been an active and faithful officer, and in his retirement will carry with him the best wishes of a large circle of railroad men, to whom he has become known through the duties of his position or in the work of the Master Mechanics' and Master Car-Builders' associations, in both of which he has taken an active part.

It is announced on authority of the President of the company that the Rome, Watertown & Ogdensburg Railroad has adopted the Ames car coupler for use on its freight cars.

A truly mournful publication is the "Obituary Number of the *South Penn Transit*," which comes to us bordered with deep black and provided with all the other evidences of woe which the ingenuity of its editors can devise. The *South Penn Transit*, as some of our readers know, is—or rather was—a very clever little periodical published with some ap-

proach to regularity by the engineer corps of the road from which it took its name. We are told with an excusable burst of emotion that it is to appear no more, the sunset gun having been fired, and with it the engineers, on Nov. 1 of the current year; and the issue bears on its title-page the appropriate motto, *Finis coronat opus*—plainly with the idea that as there was nothing else to crown the work with, the end would have to.

It would be unnecessary, and in a certain sense unfeeling, for us to lay bare to the general eye the expressions of deeper feeling contained in it, which were plainly intended only for the immediate mourners and their sympathizing friends. A list of the mourners is given, beginning with Robert H. Sayre, Chief Engineer, and Wm. Shunk, Associate Engineer, and ending with Jesse Hays, Axeman of Sub-Division A of Division IV., and it speaks well for the deceased that the mourners appear to include every member of the engineer corps. The life and history of the dead is given at some length, prefixed by the apposite quotation from Hood:

"If I was so soon to be done for,
Oh, what was I ever begun for?"

It is explained that Col. Jas. Worrall was the corpse's father, so far as can now be discovered, and that it was dry-nursed through a promising infancy by Oliver W. Barnes, the first Chief Engineer, and the other engineers mentioned. In the description of "The Last Gasp," which opens the volume, the following appears, among other touching passages:

"A death of this kind makes one believe its life was a mockery—but not from any fault of yours—far otherwise Although the sexton who now receives the corpse tells you that you have worked for a useless life, which even if it had lived would have failed to compete with its neighbor; that "it is easier to go around than over a bucket"—yet you can smile to see him cripple his already rheumatic body to merely become the possessor of this worthless thing. You have reason to believe that your skill made it dangerous. In your next undertaking keep clear of twins, especially when you have to report their growth quarterly."

The immediate cause of death is explained to be the late severe cold weather, which has greatly affected the health of the engineers as well as of the corpse, and it appears that this and their grief together have so completely overcome them that they have resolved to fall back on their friends to recuperate, and to walk home from the funeral. As usual in such tributes, a poetical dirge to the memory of the dead likewise appears; but—as is likewise not so very unusual—the grief of the author is so entirely overwhelming that he fails to be coherent, and it therefore seems more decent that we should veil his condition from the public by omitting to publish any part of it.

Altogether, this is a most creditable tribute to departed worth—creditable alike to the living and the dead. An unfeeling public may laugh at it, but "not ignorant of evil, we have learned to pity the unfortunate," and we know, and can well understand, that to the immediate mourners it is no laughing matter.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

California Southern.—Completed by laying 7 miles of track in the Cajon Pass.

Chicago, Rock Island & Pacific.—Track laid on the *St. Joseph Branch* from Winston, Mo., southwest 10 miles.

Northern Pacific.—The *Cascade Division* is extended from Green River, Wash. Ter. eastward 8 miles.

This is a total of 25 miles on 3 lines, making 2,283 miles thus far reported for the current year. The new track reported to the corresponding date for 14 years has been:

	Miles		Miles.
1885	2,283	1878	1,840
1884	3,246	1877	1,892
1883	5,410	1876	1,970
1882	9,102	1875	1,150
1881	6,241	1874	1,664
1880	5,056	1873	3,988
1879	3,024	1872	6,202

These figures include *main track only*, second tracks and sidings not being counted.

TRADE CATALOGUES.

Catalogue of Tudor Iron Works, Manufacturers of Rails, Rail Fastenings, Spikes, etc. St. Louis, Mo.

This thin little volume is a model of its kind. There is not much of it; but what there is of it is full of information. As useful a part of the book as any is six standard joint sections, showing also the rail, and giving the dimensions of rail and joint in figures. As these leading dimensions are interesting for comparison, we may abstract them:

	Rail.			Joint.					
	Weight. lbs.	Height. in.	Base. in.	Length. in	Spacing of bolt-holes.				
Cincinnati So..	60	4 1/4	4 1/4	24	2 7/8,	6,	6 1/4,	6,	2 7/8
Mo Pacific....	63	4 7/16	4 3/16	24	3,	6,	6,	6,	3
Chi., Burl. & Q.	66	4 13/32	4 1/16	26	4,	5 1/2,	7,	5 1/2,	4
Chi. & Alton..	70	4 3/8	4	36	5 7/16,	9,	7 1/8,	9,	5 7/16
Pennsylvania..	72	4 1/2	4 1/2	24	3,	5,	8,	5,	3
Lehigh Valley.	76	4 3/4	4 3/4	24	3,	6,	6,	6,	3

There is the usual cheerful variety in this list—enough variations, one would think, to suit any taste, especially in the spacing of the bolt-holes for the four 24 in. angle-bars. The various sections are equally diverse. The variety might easily have been extended, however, by adding further sections.

The remainder of the thin volume is taken up with tables of bolts, nuts, sections of light rails, and other track details. The fact that there is not a single block letter nor exhortation to purchase in the whole 30 pages is an agreeable feature, and will not probably, we suspect, lose the firm a single order.

TECHNICAL.

The Car Shops.

The Peninsular Car Works in Detroit, Mich., have recently taken a contract to build 300 freight cars for the Union Pacific road.

The Ensign Car Works in Huntingdon, W. Va., are running overtime to fill orders on hand, which include 400 box and a large number of gondola and stock cars.

The Barney & Smith Manufacturing Co. in Dayton, O., has recently completed several handsome sleeping cars, which have just been put in service on the Indiana, Bloomington & Western road.

The American Brake Co., in St. Louis, has its works busily employed, having recently received quite a number of orders for brakes for freight cars.

The St. Charles Car Co., in St. Charles, Mo., has received an order for 50 box-cars for an Illinois road.

Bridge Notes.

The contract for the piers and approaches of the Canadian Pacific Bridge over the St. Lawrence at Lachine, one of the most important bridge works let for some time, has been given to Robert Reid and Sanford Fleming, of Canada. The contract for the iron work has been let to the Dominion Bridge Co., of Montreal. A large number of bids were received, all prominent bridge works in the United States putting in their tenders, but preference was evidently given to Canadian bidders. The total cost of the bridge will be about $3,000,000, and it is to be finished by Nov. 30, 1886. Of the contractors for the piers and superstructure Mr. Fleming, is widely known as a civil engineer, and Mr. Reid was contractor for the superstructure of the International bridge at Buffalo.

R. F. Hawkins & Co., of Springfield, Mass., have leased the St. Albans Iron & Steel Works at St. Albans, Vt., and will use the buildings as a bridge shop. Hawkins & Co. are building several bridges for the Ogdensburg & Lake Champlain road.

Iron and Steel.

The Pittsburgh Steel Casting Co. report a healthy increase of business, its output of refined Bessemer steel billets and castings for the first ten months of 1885 being 4,116 tons in excess of the output for the twelve months of 1884.—*American Manufacturer.*

The E. & G. Brooke Iron Co., at Birdsboro, Pa., has begun the erection of an additional steel plant for making steel by the Clapp-Griffith process.

The Cleveland Rolling Mill Co., in Cleveland, O., has started up its two blast furnaces, which have been idle for some time.

The Saucon Iron Co., at Saucon, Pa., is preparing to put one of its furnaces in blast.

The Pittsburgh Bessemer Steel Co. is filling an order for 600 tons of 40-lb. steel rails for the Minneapolis, Lyndale & Minnetonka road.

The Franklin Iron Co. has put in blast its large furnace at Franklin Furnace, Sussex County, N. J., after a stoppage of several months.

The Vigo Iron Co., at Terre Haute, Ind., has put its furnace in blast. This furnace has been idle for several years.

Manufacturing and Business.

The Boston & Maine Railroad Co. has contracted with the Judkins Electric Signal Co. to equip all its passenger cars and locomotives with the Judkins patent train signal.

The Morden Frog & Crossing Co. is running its works in South Chicago overtime in order to fill pressing contracts.

The Vulcan Iron Works have been awarded the contract for the machinery to swing the new Lake street bridge, which includes a pair of 8 by 12 in. engines to swing, a 7 by 9 in. engine to run the dynamo, and a 5 by 7 in. engine to lock the bridge, with two steam pumps, water tank, two locomotive boilers, etc. These works have also been awarded the contract for 13 machines to hoist sluice gates at the reservoirs being erected by the government at the headwaters of the Mississippi River.—*Chicago Industrial World.*

The Livermore Foundry & Machine Co., in Memphis, Tenn., has now contracts for supplying iron and brass castings for ten different railroad lines. The works are now being operated to their full capacity. The iron castings turned out are made entirely of Alabama pig iron.

The Westinghouse Machine Co., in Pittsburgh, is enlarging and improving its works. The additions include a steam hammer for forging the connecting rods used, from steel: a brass foundry, and a furnace to be fired with natural gas. Natural gas has been introduced throughout the works. The company has recently shipped a number of engines for electric lighting and has received several orders for engines for the same purpose. In addition to the domestic orders, within a month orders have been received from the Argentine Republic, Cuba, France and Holland.

The Rail Market.

Steel Rails.—The *Iron Age* says: "The market has been very widely misrepresented by interested parties, and a good deal of sensational reporting has been indulged in. The facts obtained from the most reliable sources are these: Up to Nov. 1 the rail mills had booked an aggregate within a few thousand tons of 400,000 tons of rails for 1886 delivery, that being the result of the returns to the Board of Control. Since then Eastern and Western mills have closed between 75,000 and 100,000 tons more, and, with the inquiries in the market, it is likely that, before the week is ended, fully, if not more than, 500,000 tons will be on the order-books of the mills. During the past week there have been sales to Southern roads aggregating about 20,000 tons. Of these, one is for prompt delivery of a small lot at $32 at tidewater; another, a larger lot, for 1886, at the same figure, and one lot of 10,000 tons for a Florida railroad at $34 at tidewater. The latter sale has been widely quoted as proving a large advance in rails. It is, however, to a receiver, and it is likely that the conditions of sale are such that it is not a fair test of the market. This is shown by the fact that the sales alluded to above were made only a day or two before it, and that since then a New England road which was on the market for a small lot did not accept bids equivalent to $31 at mill. There have been large sales of rails in the West, two orders alone aggregating 18,000 tons. The bulk of this business has been done on the basis of $34@$34.50 at Chicago. We quote at Eastern mill $31@$32, according to conditions affecting point of delivery, etc. The rail market is firm, with an upward tendency."

Rail Fastenings.—There has been a slight increase in nominal prices, which are now 2 cents per lb. for spikes in Pittsburgh: 2.60@2.80 for track-bolts and 1.60@1.70 for splice-bars.

A Long Run.

On Oct. 10 last, Lombard, Ayres & Co. shut down a 65 H. P. Westinghouse engine after a practically continuous run of eleven months. The engine was started in November, 1884, and after a run of three months was stopped to make a trifling repair; starting again almost immediately, they ran continuously for eight months more, with two stops in that time long enough to lace a belt. The engine was finally shut down for the purpose of removing it to another building, and an examination revealed that no repairs were necessary. It is belted direct to a fan blower. In another part of the works is a smaller engine of the same make, which is now on its seventh month of continuous running, and still a third engine on its third month.

The Cost of Change of Gauge.

The report of the Mobile & Ohio Co. for 1884–85 gives the following as the cost of changing the gauge of the equipment from 5 ft. to 4 ft. 8½ in.:

	Number.	Labor.	Material.	Total.	Cost per engine or car.
Engines and tenders...	47	$8,032	$7,267	$15,309	$325.70
Pass., bag. and ex. cars	55	438	104	542	9.87
Freight cars....1,361					
Freight trucks. 107½					
	1,468½	5,719	740	6,459	4 40
Lever and pole cars...	143	1,428	477	1,905	13.32

For this equipment the cost was $45.95 per mile of road. The cost of changing the track was $27.99, making a total of $73.94 per mile of road. Not all the locomotives owned by the company were changed, a number being considered not worth the expenditure required.

The New Bridge over the St. Lawrence.

The Canadian Pacific bridge over the St. Lawrence at Lachine, which has been planned by Chief Engineer Peterson, will consist of two spans of 269 ft. each, two of 408 ft. each, the channel spans, and eight of 242 ft. It will be a simple iron girder truss bridge, the channel spans being through spans and the others deck spans. The contracts for the superstructure have been let to the Dominion Bridge Co., and for the substructure to Reid & Fleming.

Fast Time.

The Ohio & Mississippi Railroad has astonished the railroad fraternity by making a fast trip with one of its passenger trains from Louisville to St. Louis, the time made being the best (for the distance) ever made by any line running into this city. Last Sunday morning at 2 o'clock the train, consisting of five cars and having on board the Robson & Crane theatrical combination, left Louisville. After making 13 stops and changing engines twice, it arrived in St. Louis at 10:45 o'clock. The running time of the train was 7 hours and 45 minutes, and the distance covered was 320 miles. Thus, it will be seen, the train averaged more than 40 miles an hour during the entire journey.—*St. Louis Republican, Oct. 26.*

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Boston & Albany, annual meeting, at the Meionaon in Boston, at 11 a. m. on Dec. 9.

Boston & Providence, annual meeting, at the passenger station in Boston, at 11:30 a. m. on Nov. 18.

Mobile & Ohio, annual meeting of the debenture holders (who name the directors), at the office, No. 11 Pine street, New York, Nov. 21.

New York, Lake Erie & Western, annual meeting, at the office in New York, Nov. 24.

Old Colony, annual meeting, at the United States Hotel in Boston, at 10:30 a. m. on Nov. 24.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Catawissa (leased to Philadelphia & Reading), 3½ per cent., semi-annual, on the preferred stock, payable Nov. 18

Chicago, Burlington & Quincy, 2 per cent., quaterly, payable Dec. 15, to stockholders of record on Nov. 21.

Cleveland & Pittsburgh (leased to Pennsylvania Co.), 1¾ per cent., quarterly, payable Dec. 1, to stockholders of record on Nov. 10.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be as follows:

The *Central Club of Car Accountants* will hold its next meeting in Columbus, O., on Wednesday, Nov. 18.

The *New England Railroad Club* will hold its next regular monthly meeting at its rooms in Boston on Wednesday evening, Nov. 18.

The *Master Car-Builders' Club* will hold its regular monthly meeting at the rooms, No. 113 Liberty street, New York, on Thursday evening, Nov. 19.

The *Eastern Division of the Car Accountants' Association* will hold a quarterly meeting in Philadelphia, on Thursday, Nov. 19.

Foreclosure Sales.

The *Annapolis & Elkridge* road was sold in Baltimore, Nov. 10, by the trustees under foreclosure of mortgage, and was bought for $100,000 for account of the bondholders. The road is 19 miles long, extending from Annapolis, Md., to Annapolis Junction on the Washington branch of the Baltimore & Ohio. The proceedings in foreclosure have been in progress for several years, having been delayed by an attempt of the state of Maryland, which owns the larger part of the stock, to enjoin the sale.

Master Car-Builders' Club.

A business and social meeting of the Master Car-Builders' Club will be held at the rooms, No. 113 Liberty street, New York, Thursday, Nov. 19, at 8 o'clock p. m.

Subject of Discussion.—Heating, Lighting and Ventilating Passenger Cars; including Safety Hatches in Roofs of Cars carrying Passengers.

New England Railroad Club.

The regular monthly meeting of this club will be held at its rooms in the Boston & Albany passenger station, in Boston, on Wednesday, Nov. 18, at 7:30 p. m.

Subjects for Discussion.—Is it Economy to Grind Chilled Wheels? Is it Economy to Use Steel-tired Wheels for Passenger Service?

These subjects are continued from the last meeting, when their discussion was not finished. All persons interested are cordially invited to be present.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—Superintendent W. P. Harris of the Pittsburgh Division has appointed R. T. Dennis Trainmaster of the Wheeling District, with headquarters at Wheeling, and S. McElroy General Yardmaster in charge of the Pittsburgh and Glenwood yards. W. J. Bonner is continued as Trainmaster of the Pittsburgh Division, with headquarters at Connellsville.

Camden & Atlantic.—Mr. George W. Creighton is appointed Assistant Engineer in place of F. P. Abercrombie transferred to the Northern Central road.

Central Iowa.—Mr. E. E. Carver has been appointed Master Car-Builder, with office at Marshalltown, Iowa.

Chicago & Alton.—Mr. John Nesbitt has been appointed General Live Stock Agent, with headquarters in St. Louis. He will also be called upon as occasion may require to repre-

sent the freight department of the company in other matters than live stock. Hiram L. Evans, formerly of the Chicago, Burlington & Quincy, has been appointed Master of Transportation, with office at Joliet.

Chicago, Burlington & Northern.—Mr. George B. Harris has been appointed Assistant to the President. Mr. Harris was for a time Assistant General Manager of the Atchison, Topeka & Santa Fe, and before that was Purchasing Agent of the Chicago, Burlington & Quincy.

Cincinnati, Indianapolis, St. Louis & Chicago.—The new board has re-elected M. E. Ingalls, President; E. F. Osborn, Secretary and Treasurer; John Egan, General Passenger and Ticket Agent; H. J. Page, General Freight Agent.

Cleveland, Columbus, Cincinnati & Indianapolis and *Indianapolis & St. Louis.*—Mr T. J. Helm, is appointed agent of these companies at Indianapolis, Ind., vice Mr. J. Q. Van Winkle, promoted to Division Freight Agent; appointment taking effect Nov. 1.

Detroit, Lansing & Northern.—On Nov. 1, Chief Engineer J. J. McVean assumed entire charge of all buildings, bridges and water stations on this road, and will superintend the construction and repairs of the same. Foremen of all bridge and carpenter gangs will report to him for instructions.

Evansville & Indianapolis.—The directors of this company are Edwin Taylor, William Heilman, S. M. Archer, W. D. Ewing, E. P. Huston, D. J. Mackay and E. E. Law. It is controlled by the Evansville & Terre Haute.

Fremont, Elkhorn & Missouri Valley.—Mr. E. C. Harris is appointed Superintendent of Telegraph, with office at Missouri Valley, Iowa.

Georgia Railroad Commission.—The Board of Railroad Commissioners, of Georgia have elected Major Campbell Wallace Chairman, to succeed Ex-Governor Smith, retired. Major Wallace has served for some time as a Commissioner, and has been one of the most active members of the Board.

Hannibal & St. Joseph.—At the annual meeting in Hannibal, Mo., Nov. 2, the following directors were chosen: C. E. Perkins, W. W. Baldwin, W. J. Ladd, Henry Parkman, A. G. Stanwood, Chas. J. Payne, E. E. Payne. The company is controlled by the Chicago, Burlington & Quincy.

Jamestown & Buffalo.—The officers of this new company are: President, C. A. Clute, Fredonia, N. Y.; Vice-President, J. A. Burch, Buffalo, N. Y.; Secretary, O. W. Gawne.

Knoxville & Ohio.—This company, which is owned by the East Tennessee, Virginia & Georgia, has elected C. M. McGhee President; Samuel Thomas, Vice-President; John L. Moses, Secretary; J. G. Mitchell, Treasurer.

Louisville, New Albany & Chicago.—Mr. Samuel Phillips has been appointed General Agent in Louisville, Ky. He was recently on the Missouri Pacific road.

Manhattan.—At the annual meeting in New York, Nov. 11, the following directors were chosen: Jay Gould, J. Pierpont Morgan, Russell Sage, R. M. Gallaway, Cyrus W. Field, John H. Hall, Chester W. Chapin, George J. Gould, Sidney Dillon, Samuel Sloan, Edward M. Field, Simon Wormser, S. V. White. Messrs. Morgan and White are new directors, replacing Washington E. Conner and T. W. Pearsall. The board re-elected Jay Gould, President; R. M. Gallaway, Vice-President; D. W. McWilliams, Secretary and Treasurer.

Mineral Range.—Mr. R. H. Brelsford is appointed General Freight and Passenger Agent of this company, vice Mr. W. H. Carr, resigned.

New England & Southwestern.—The officers of this new company are: President, Chauncey Vibbard, Albany, N. Y.; General Manager, Charles H. Swan, New York; Chief Engineer, Wm. V. Smith.

Northern Central.—Mr. F. P. Abercombie has been appointed Assistant Engineer of the Sunbury and Shamokin divisions in place of Mr. G. W. Creighton. Mr. Creighton is transferred to the West Jersey road, taking the place vacated by Mr. Abercombie.

Pennsylvania.—Recent changes in the department of maintenance of way are as follows:

G. L. Cummins, Supervisor of Division No. 1, Philadelphia Division, vice J. Craig, deceased; S. C. Long, Supervisor of Division No. 3, Philadelphia Division, vice G. A. Starkweather, transferred; G. S. Nichols, Supervisor of Division No. 16, Monongahela Division, vice S. C. Long, transferred; G. A. Starkweather, Supervisor Division No. 21, Tyrone Division, vice G. L. Cummins, transferred; J. H. Murphy, Supervisor Division No. 26, Frederick Division, vice J. S. Nichols, transferred.

Sioux City & Pacific.—Mr. E. C. Harris is appointed Superintendent of Telegraph, with office at Missouri Valley, Iowa.

Southern Central.—At the annual meeting in Auburn, N. Y., Nov. 11, the following directors were elected: Thomas C. Platt, E. B. Wilbur, J. N. Knapp, C. L. Rich, J. W. Dwight, H. L. Starke, R. W. Clinton, J. G. Knapp, D. H. Marsh, E. D. Clapp, E. D. Woodruff, William Stevenson and John Taylor. Thomas C. Platt was elected President; J. W. Dwight, Vice-President; J. N. Knapp, Secretary; C. L. Rich, Treasurer; H. L. Starke, General Agent; W. Stevenson, Managing Director; John Taylor, General Traffic Manager.

Southern Pacific Co.—Mr. E. W. How has been appointed Assistant General Freight Agent of this company's Atlantic System, with office in New Orleans.

Tulare Valley & Giant Forest.—The directors of this new company are: Henry Miller, Visalia, Cal.; R. Butterfield, Sacramento, Cal.; E. C. Anderson, R. A. Gilbride, B. G. Haskell, James B. Johnson, James J. Martin, Wm. C. Owen, Martin Schneider, San Francisco.

Wabash, Chester & Western.—Mr. F. L. Hinckley is appointed Superintendent, with office in Chester, Ill., in place of Robert Meek, resigned.

West Jersey.—Mr. George W. Creighton is appointed Assistant Engineer in charge of maintenance of way, in place of Mr. F. P. Abercrombie, who goes to the Northern Central road, to take the similar position recently held by Mr. Creighton on that road.

PERSONAL.

—Mr. Robert Meek has resigned his position as Superintendent of the Wabash, Chester & Western road.

—It is reported that Mr. F. Broughton has resigned his position as General Manager of the Chicago & Atlantic road.

—It is reported that Mr. R. C. Vilas, late Traffic Manager of the New York, Lake Erie & Western, has been offered the position of General Manager of the Chicago & Atlantic road.

—Mr. Milo Pendleton, Master Mechanic of the Seaboard & Roanoke Railroad for a number of years past, died, Nov. 7, at his residence in Norfolk, Va. Mr. Pendleton was highly esteemed both for his efficiency as a master mechanic and for his personal qualities.

—Mr. A. J. Harlow has resigned his position as New England Passenger Agent of the Michigan Central Railroad. Mr. Harlow has been connected with the company for 27 years, and the circular announcing his resignation pays a high tribute to his efficiency and integrity while in office.

—Mr. George K. Jewett, who died at his residence in Boston, Nov. 4, was born in Gardner, Me., in 1812. He was for 40 years a resident of Bangor, Me., and was largely interested in the lumber business there. Some years ago he retired from business and settled in Boston, although he still retained the presidency of the Glendon Lumber Co. Mr. Jewett was one of the first projectors of the European & North American road, in which he held a large interest. He was a director of the company from its first organization and for several years served as President and General Manager.

—Hon. Leland Stanford, President of the Central Pacific Co. and United States Senator from California, recently announced his intention of establishing a new university in that state as a memorial of his deceased son. His plans have now been definitely announced. The site of the university will be his estate at Palo Alto, about 30 miles from San Francisco, and he will build there the necessary buildings on a magnificent scale. He will give to the university at once his Palo Alto, Gridley and Vina properties, which are estimated to be worth about $5,000,000, and also announces his intention of ultimately endowing it with the greater portion of his estate, which will make it one of the wealthiest educational institutions in the world.

—Mr. F. M. Wilder, Superintendent of Motive Power of the New York, Lake Erie & Western Railroad, has been offered and has accepted the position of General Superintendent of the Corliss Steam Engine Co., of Providence, R. I., with an interest in the works. The Corliss Works are now closed as respects new orders for the purpose of effecting a reorganization of the works and machinery. Mr. Wilder expects to close his connection with the Erie about the close of the present year or as soon as his successor is appointed. He has been connected with the Erie since the beginning of his railroad service, in 1859, and has risen steadily through every grade to its highest mechanical position, in which his administration is generally understood to have been conspiciously successful and satisfactory.

—Mr. Miles Greenwood died suddenly at his residence in Cincinnati, Nov. 6, aged 78 years. Mr. Greenwood was born in Jersey City, but at an early age removed with his family to the West and afterward settled in Cincinnati. He was for many years engaged there in the foundry and iron manufacturing business, in which he was very successful and accumulated a considerable property. He took a prominent part in all measures intended to forward the interests of the city, and held at different times several important offices of trust. He early took an interest in the project for the construction of the Cincinnati Southern road by the city and was one of the prominent advocates for building that line. In 1869 he was appointed one of the trustees of the road, and was soon after made President of the board.

TRAFFIC AND EARNINGS.

Coal.

Bituminous coal tonnages for the ten months to Oct. 31 are reported as follows:

	1885.	1884.	Inc. or Dec	P. c.
Cumberland, all lines....	2,305,157	2,410,036	D. 104,879	4.3
Huntingdon & Broad Top	133,562	165,854	D. 32,292	19.4
Barclay R. R. & Coal Co.	195,942	248,399	D. 52,457	21.2
Pennsylvania R. R.:				
Clearfield...	2,390,617	2,627,579	D. 236 962	9.
Mountain District	440,009	338,432	I. 101,577	29.7
Penn and Westmoreland....	1,034,062	1,100,430	D. 66,368	6.0
Minor districts...	881,406	901,950	D. 20,544	2.3
Total....	7,380,755	7,792,680	D. 411,925	5.3

With one or two local exceptions all the bituminous districts reporting show decreases this year.

Coke tonnages for the ten months to Oct. 31 are reported as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Southwest Penna. R. R....	1,595,862	1,780,559	D. 184,697	10.4
Other districts, Pa. R. R..	513,387	393,616	I. 119,771	30.4
Connellsville, *via* Pa. R. R.	48,779	275,125	D. 226,346	82 3
Total...	2,158,028	2,449,300	D. 291,272	11.9

These tonnages are all over the Pennsylvania Railroad, no other line reporting coke tonnages regularly.

Actual tonnage passing over the Pennsylvania & New York road for the eleven months of its fiscal year from Dec. 1 to Oct. 31 was:

	1885.	1884.	Inc. or Dec.	P. c.
Anthracite	1,263,879	1,221,298	I. 42,581	3.5
Bituminous...	214,232	281,155	D. 66,923	23.8
Total.....	1,478,111	1,502,453	D. 24,342	1.6

The larger part of the anthracite comes from the Lehigh Valley road, of which this line is an extension.

For the ten months to Oct. 31 this year the Tennessee Coal, Iron & Railroad Co. shipped from its mines 113,768 tons of coal and 89,214 tons of coke, a total of 202,982 tons. These shipments are over the Nashville, Chattanooga & St. Louis road.

Cumberland coal shipments for the week ending Nov. 7 were 60,597 tons. Total to Nov. 7 this year, 2,365,755; last year, 2,474,235; decrease, 108,480 tons, or 4.4 per cent.

The coal tonnage of the Pennsylvania Railroad for the week ending Nov. 7 was:

	Coal.	Coke.	Total.	1884.
Line of road....	154.341	52,468	206,809	177,035
From other lines.	88,793	2,661	91,456	61,578
Total.....	243,134	55,129	298,263	238,613
Year to Nov. 7..	9,559,220	2,185,800	11,745,020	11,277,180

Increase for the week, 59,650 tons, or 26.7 per cent.; increase for the year, 467,840 tons, or 4.1 per cent.

Cotton.

Cotton movement for the week ending Nov. 6 is reported as follows, in bales:

	1885.	1884.	Inc. or Dec.	P. c.
Interior markets:				
Receipts....	196,017	147,220	I. 48,797	33.2
Shipments....	145,680	128,282	I. 17,398	13.6
Stock, Nov. 6	256,644	174,996	I. 81,648	46.7
Seaports:				
Receipts..	274,422	257,041	I. 17,381	6 8
Exports	151,663	168,026	D. 16,357	9.7
Stock, Nov. 6	690,483	749,522	D. 59,039	7.9

The total movement from plantations for the crop year (from Sept. 1) to Nov. 6 is estimated at 2,116,825 bales, against 1,998,926 last year, 2,183,463 in 1883 and 2,034,029 in 1882.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Ten months to Oct. 31:				
Bur., C. R. & No.	$2,513,598	$2,231,906	I. $281,692	12.6
Canadian Pacific.	6.790.654	4,588,597	I. 2,202,057	48.0
Central Iowa.....	1,054,076	1,207,765	D. 153,089	12.7
Chicago & Alton.	6,533,158	7,262,706	D. 729,548	10.0
Chi. & East. Ill..	1,342,809	1,277,730	I. 65,079	5.1
Chi. & Nor'west.	19,985,251	19,543,643	I. 441,608	2.2
Ch., St. P., M. & O.	4,757,733	4,799,783	D. 42,050	0.9
Chi. & W. Mich..	1,070,782	1,269,506	D. 198,724	16.4
C., L., St. L & C.	1,973,072	2,035,374	D. 62,302	3.1
Denver & R. G...	5,041,460	4,533,286	I. 508,174	11.2
Det., Lan. & No.	1,009,282	1,147,634	D. 138,352	12.0
Flint & Pere M..	1,584,294	1,920,766	D. 336,472	17.6
Gulf, Col. & S. F.	1,372,334	1,424,891	D. 52,557	3.7
Illinois Central ..	8,095.516	8,319,863	I. 375,653	4.5
Iowa lines. ...	1,329.571	1,409,080	D. 80.109	5.7
Ind., Bloom. & W.	1,971,022	1,949.034	I. 21,988	1.1
Louisv. & Nashv.	11.361,575	11,170.742	I. 190.833	1.7
Mexican Central.	2,897,419	2,397,977	I. 499,442	21.8
Mil., L. S. & W..	1,095,257	931,513	I. 163,754	17.6
Mil. & Northern.	462,713	434.844	I. 27,869	6.4
Mobile & Ohio..	1,537,035	1,622,443	D. 85,408	5.3
Norfolk & West..	2,227,469	2,194,042	I. 33,427	1.5
Northern Pacific.	9,324,566	10.738.697	D. 1,414,131	13.2
Ohio Southern...	377.075	376,146	I. 929	0.2
Roch. & Pitts....	1,002.923	945.296	I. 57,627	6.1
St. P. & Duluth.	1,097.174	1,058,136	I. 39,038	3 7
St. P., M. & Man.	5,938,698	6,615.318	D. 676.620	10.2
Wisconsin Cent..	1,174,480	1,151,621	I. 22,859	2.0
Nine months to Sept. 30:				
Canadian Pac. ..	$5 908.654	$3,853.066	I. $2 055,588	53.3
Net earnings..	2.289,382	477,914	I. 1.811,468	379.0
California South.	106,669	74,385	I. 32,284	43.4
Chi., Bur. & Q...	19,050.140	18,505,825	I. 544.315	3.0
Net earnings...	8,449,735	8,716,103	D. 266.368	3.1
L. Rock & Ft. S..	371,186	355.174	I. 16.012	4.5
L. R., M. R. & T.	211,614	227,480	D. 15.866	6.9
Oreg. Short Line.	1,321,092	658,369	I. 664.723	109.5
Net earnings..	419,578	78,190	I. 341,388	435.9
Eight months to Aug. 31:				
Hous. & Tex. C..	$1,234,161	$1,425.185	D. $191.024	13.4
Net earnings ..	50,093	383,314	D. 332,221	86.6
Month of August:				
Hous. & Tex. C..	$240,468	$193,878	I. $46,590	24.0
Net earnings...	54,284	69,392	D. 15,108	21.7
Month of September:				
Canadian Pac....	$823,487	$639,840	I. $183,647	28.7
Net earnings...	356,864	232,211	I. 124,653	52.7
California South.	12,922	7,162	I. 5,760	80.4
Net earnings...	2.034	*120	I. 2 154	....
Chi., Bur. & Q....	2,640,034	2,707.110	D. 67,076	2.5
Net earnings...	1,496,831	1,585,324	D. 88,493	5.6
L. Rock & Ft. S..	49,797	48,271	I. 1,526	3.2
L. R., M. R. & T.	26,245	26,419	D. 174	0.6
Oreg. Short Line.	184.174	96,741	I. 87,433	90.4
Net earnings...	66,222	47,655	I. 18,567	38.9
Month of October:				
Bur., C. R. & No.	$349,502	$281,443	I. $68,059	24.6
Canadian Pac...	882,000	735,531	I. 146,469	19.9
Central Iowa.....	147,814	154,033	D. 6,219	4.0
Chi. & Alton....	747,140	889,037	D. 141,897	15.8
Chi. & East. Ill..	154,215	156,567	D. 2,352	1.5
Chi. & Nor'west.	2,793,600	2,523,843	I. 269,757	10.7
C., St. P., M. & O.	695,900	642,460	I. 53,440	8.3
Chi. & W. Mich..	124.640	128,035	D. 3,395	2.6
C., L. St. L & C.	219,316	241,145	D. 21,829	9.1
Denver & R. G..	639,049	567,285	I. 71,764	12.6
Det., Lan. & No.	135,245	133,110	I. 2,135	1.6
Flint & Pere M..	188,735	186,945	I. 1,790	0.9
Gulf, Col. & S. F.	290,011	211,061	I. 78,950	37.8
Illinois Central ..	1,082,735	1,078,544	I. 4,191	0.4
Iowa lines	168,018	184,867	D. 16,849	9.1
Ind., Bloom. & W.	227,116	224,500	I. 2,616	1.2
Louisv. & Nash..	1,244,911	1,291,714	D. 46,803	3.6
L., N. O. & Tex..	156,043	.....	.....	...
Manhattan	615,516	593,482	I. 22,034	3.7
Mexican Cent....	247,000	292,723	D. 45,723	15.6
Mil., L. S. & W..	158,026	103,837	I. 54,189	52.1
Mil. & Northern.	53,940	53,071	I. 869	1.6
Mobile & Ohio...	225,243	212,459	I. 12,786	6.0
Norfolk & West..	262,394	263,298	D. 904	0.3
Northern Pacific.	1,521,881	1,461,511	I. 60,370	4.1
Ohio Southern...	52,130	46,313	I. 5,817	12.6
Oregon & Cal..	654,700	482,200	I. 172,500	35.8
Net earnings...	376,000	259,500	I. 116,500	44.8
Roch. & Pitts....	116,470	114,494	I. 1,976	1.7
St. P. & Duluth..	181,993	166,633	I. 15,360	9.2
St. P., M. & Man.	998,858	1,014,862	D. 16,004	1.6
Staten Island....	53,511	46,748	I. 6,763	14.4
Wisconsin Cent..	143,618	140,439	I. 3,179	2.3
Week ending Oct. 31:				
Grand Trunk	$325,440	$368,973	D. $43.533	11.8
First week in November:				
Chi. & Alton.....	$170,475	$175,065	D. $4,590	2.6
Chi., Mil. & St. P.	607,000	553,387	I. 53,613	9.7
Long Island.....	58,470	52,256	I. 6,214	11.9
Mil., L. S. & W.	33,250	23,150	I. 10,100	43.9
St. L. & San F...	97,900	88,100	I. 9,800	11.1

* Deficit.

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

New England Railroad Earnings.

The following statements of New England railroads have been made for the year ending Sept. 30 last:

	Earnings.	Expenses.	Net earnings.
Boston & Providence.....	$1,677,066	$1,284.116	$392,950
1883-84	1,727.148	1,363,119	364.029
Martha's Vineyard	6,131	3,983	2,148
1883 84.....	5,622	3,861	1,761
Nantucket.....	9,033	3,853	5.180
1885-84.....	9.066	2,919	6,147
N. Y. & N. England.....	3,303,675	2,356.459	947,216
1883-84	3.362,033	2,941.626	420,407
Prov. & Worcester.....	1,077,166	755,659	321,507
1883-84.....	1,136 633	869,901	266,732
Union Freight.....	74,041	46,306	27,735
1883-84.....	72,475	50,079	22,396

The Union Freight road is a short connecting line in the city of Boston.

Georgia Railroad Commission.

The Georgia Railroad Commission met in Atlanta, Nov. 4, to consider the petion of the Atlanta Chamber of Commerce protesting against the pooling system on freights over the various lines under the organization of the Southern Railway & Steamship Association. The petition claims that the pooling is contrary to law, and also claims that the rates fixed by the Association discriminate injuriously against Atlanta and other Georgia cities. The petitioners were represented by counsel, and counsel were also present for the Central, the Georgia, the Richmond & Danville, and the East Tennessee, Virginia & Georgia Co. The railroad companies claim that the Commission has no jurisdiction in the premises, as the pooling of freights over lines located in and outside of the state was interstate commerce, and consequently beyond the jurisdiction of the state board. On the other hand, counsel for petitioners argued that the Commission has authority to regulate such matters where Georgia railroads formed a part of the line over which the pooling was done. The arguments were based entirely on this question of jurisdiction, and at

their close the Board decided to take the matter under consideration, promising to render a decision at an early date. The question of the legality of the pools and the justice of the rates will probably be gone into hereafter should the Commission decide that it has jurisdiction.

East-bound Rates.

Orders were received in Chicago, Nov. 10, to advance east-bound freight rates to a basis of 25 cents per 100 lbs. on grain and 30 cents on provisions to New York. This is an advance of 5 cents from the present rates, and is to take effect Nov. 23.

Lake and Canal Rates.

The Buffalo *Commercial Advertiser* says: "A very peculiar condition of affairs exists in the grain trade of this country at present. The elevators of this city, which have been made the subject of so many abusive articles in outside papers are now found very useful, but with their great capacity they are not capable of holding all the grain seeking storage here. They are literally full, and cannot take any more grain. The same is true, but not to so marked a degree, of the elevators at nearly all of the grain-receiving ports of the West. There has been as a result a more liberal movement of grain of late, although the demand continues nearly nominal. The fact is the grain had to be kept moving because there was no storage capacity to receive it. Consequently freights ruled higher last month than at any time during the season. The following exhibit shows the average rates on wheat and corn from Chicago to Buffalo by lake, and the average on the same cereals by canal from Buffalo to New York, for the month of October, in the years named:

	Lake— Wheat. Cents.	Lake— Corn. Cents.	Canal— Wheat. Cents.	Canal— Corn. Cents.
1885	3.1	2.2	4.2	3.9
1884	2.0	1.7	5.0	4.4
1883	3.7	3.5	5.5	5.0
1882	2.9	2.6	6.8	6.2
1881	2.5	2.2	5.0	4.5
1880	6.8	6.3	6.7	6.0
1879	7.7	7.1	8.0	7.9
1878	3.6	3.3	8.0	7.9
1877	4.9	4.4	10.9	6.2
1876	4.4	4.0	8.3	7.5
1875	3.7	3.4	8.2	7.4
1874	4.1	3.8	9.5	8.5

"During the last half of October freights ruled firm, and have steadily advanced to the present time. Yesterday the going rate from Chicago to Buffalo was 4 cents a bushel on wheat and 6 cents by canal to New York, which are good paying rates. But the grain stops at New York, there being no export demand of any consequence. When the storage capacity there fills up, the question is, what is to be done with the fresh arrivals all along the line from Chicago and Duluth to the seaboard? The bulk of the new crop is still to come forward, but there is already more grain in sight than can be conveniently cared for."

Colorado-California Association.

A meeting was held in Chicago, Nov. 6, at which it was decided to form the Colorado-California Association, to govern all freight shipments between Colorado points and points in California and Oregon. The roads concerned were the Union Pacific, the Burlington & Missouri River, the Atchison, Topeka & Santa Fe, the Denver & Rio Grande, and the Denver & Rio Grande Western. The Central Pacific will not be directly a party to the association.

Chicago, St. Louis & Missouri River Association.

At a meeting of this association in Chicago, Nov. 6, after some discussion, the points of difference in the association were referred to a committee consisting of Messrs. R. R. Cable, T. J. Potter and J. C. McMullen, who are to consider the redemption of foreign coupons when exposed for sale at association points, and the transportation of jewelers' sample trunks. The restricted issue of commercial mileage tickets was referred to another committee.

Colorado-Utah Association.

At a meeting of the Colorado Utah Association held in Chicago, Nov. 7, no change in rates was made, but some points at issue as to rates now existing were settled. The Commissioner was authorized to confer with the St. Louis & San Francisco road with the view to inducing that company to become a member of the association.

Brooklyn Bridge.

The statement presented to the Brooklyn Bridge trustees shows that in the month of October 321,702 foot passengers crossed the bridge and 1,920,041 were carried by the cars, making a total of 2,241,743 persons crossing the bridge, exclusive of drivers going over with teams. The total receipts of the month from tolls were $61,286, an average of $1,977 per day. These are the largest receipts from tolls that the bridge ever had in one month, and are $11,250 greater than in October of last year, which was before the reduction of toll. The present charge is 2½ cents for passage over the bridge in the cars and ⅓ of one cent for each foot passenger.

Western Railway Weighing Association.

Superintendent J. R. Wheeler, of the Western Railway Weighing Association, makes the following report: Cars weighed October, 1885, 81,594; cars weighed September, 1885, 67,121; cars weighed October, 1884, 60,135. Increase over September, 1885, 14,473 cars, and over October, 1884, 21,359 cars.

New England Traffic Notes.

The New England Railroad Clearing House reports 45,717 loaded cars coming into New England at all points during the month of October against 42,608 in October of last year; showing an increase of 3,109 cars or 7.2 per cent.

Western Freight Association.

A meeting of the Western Freight Association was held in Chicago, Nov. 6, at which the principal subject for discussion was the contract of the St. Paul road with Hammond & Co. for the shipment of dressed beef and live stock below the Association rates. Nothing was done, owing to the refusal of the St. Paul road to pay the differences claimed by the Association.

On the following day a meeting of the freight agents of the roads in the Association was held to consider the question of carload rates, over which there has been so much discussion recently. The principal object of this meeting was to settle the differences between carload and smaller freights on several staple articles. After much discussion it was decided that the addition on sugar, molasses, canned goods and similar articles shall be 3½ cents per 100 lbs. between carload and less quantities between St. Louis and Missouri River points. In regard to all other articles it was decided that the difference between carload and smaller lots shall not exceed 20 per cent. This is a reduction of about 15 per cent. in the differences and was made in response to the demand of the merchants of Chicago, Milwaukee and St. Louis.

Northwestern Traffic Association.

The winter tariff between Chicago and Milwaukee on the east and St. Paul, Minneapolis, and Minnesota Transfer on the west, to go into effect Nov. 16, has been fixed as follows:

	Class. 1.	2.	3.	4.	5.
Per 100 lbs	$0.60	$0.45	$0.35	$0 22½	$0.17½
	A.	B.	C.	D.	Lumber
	22½	20	17½	15	15
	Horses.	Cattle and hogs.	Sheep.	Calves.	
Per car-load	$50	$40	$30	$50	

Rails pay $2.50 per gross ton (11.16 cents per 100), splice-bars, nut locks and other joint fastening, 12½ cents per 100, salt, cement and plaster, 12½; wheat and flour, 17½; other grain, 15; base bullion valued at $100 per ton, 12½ cents; petroleum and its products, in tanks, barrels or cases, 17½. The rates are considerably lower than last year for the higher classes, a little lower on most of the lower classes, and the same for grain.

During the month of October the earnings of the roads in the Northwestern Traffic Association from East-bound business was as follows:

Roads.	Earnings.	Per cent.
C., M. & St. P	$103,094	38.7
C., St. P., M. & O	88,245	33.1
M. & St. L.	75,723	28.2
Totals	$267,062	100.0
Western route	20,184	9.2

The St. Paul was $7,113 and the Omaha $1,596 over its allotment, while the Minneapolis & St. Louis was $8,710 and the Western Route $13,105 below.

Central Iowa Traffic Association.

The following table shows the corrected earnings and balances of the roads in the Central Iowa Traffic Association for the month of September:

Road.	Revenue.	Allotted per cent.
C., R. I. & P	$23,075	40
C. & N. W	9,200	15
C., B. & Q	6,256	15
C., M. & St. P	5,948	15
W., St. L. & P	5,323	15
Totals	$49,802	100

The Rock Island was $3,154, and the Northwestern $1,730 over its percentage, the Burlington falling short $1,214, the St. Paul $1,522, and the Wabash $2,147.

Trunk Lines Executive Committee.

At a meeting held in New York, Nov. 10, the Committee voted to admit the Baltimore & Ohio as a member of the passenger pool. It is understood that the Pennsylvania agrees to permit the trains of that road to run to New York over its tracks hereafter.

West-bound Rates.

An increase of rates went into effect on Nov. 18, the new rates from New York to Chicago being: First-class, 75 cents per 100 lbs.; second, 60; third, 45; fourth, 35; special, 25 cents.

RAILROAD LAW.

Responsibility for Cars.

Judge Samuel Treat, in the United States Circuit Court yesterday, delivered an interesting opinion in the case of the Missouri Pacific Railway Co. against the Chicago & Alton Railway Co., which throws light upon the vexed question of ownership of and responsibility for cars given to another road in the regular course of railroad traffic. Said the court:

It appears that the course of through traffic among railroads requires each to receive cars owned by other than the transporting road and forward the same; and accepting the general principle stated in 109, Illinois Reports, 135, that each road as to said cars by it so received and forwarded to the next road is under the obligations of a common carrier, the case before the Court shows that there were 10 cars to be delivered to the Advance Elevator, and received by the defendant for that purpose. Six of these were actually delivered and were in possession of said elevator. Four of said 10, still in actual possession of the defendant, had been tendered to said elevator and remained in the custody of the defendant from the inability of the elevator to receive the same when so tendered.

All of these cars were destroyed by fire without any fault of the defendant. As to the six cars actually delivered and so destroyed, there evidently can be no recovery. The duties of the defendants as to the other four of said cars were simply those of a warehouseman. When a common carrier transports merchandise and delivers the same to the consignee, its obligations with respect thereto are at an end. If, however, the same are tendered to him and through no fault of the carrier he does not, or will not, receive the same, the carrier can cause the same to be stored at the risk of the consignee or retain possession of the same simply as a warehouseman. Were this not so the through traffic from one part to the other of this vast country would compel not only the breaking up, but the stoppage of trains, if at the intermediate points of delivery the consignee failed or refused to receive consignments.

In this case, if we treat the transportation of cars as if merchandise to be received and delivered to the consignee, it appears that these cars, with their contents, were to be delivered loaded with grain to the elevator. If both the cars and their contents are to be covered by the same rule, then the delivery of the cars with their contents terminates the obligations of the defendant.

The Court is not prepared to say that where a railroad car, in the course of through transportation, is received to be delivered to another railroad and has been so delivered, it is bound to cause the same to be returned either to the owner of the car or to the railroad from which the same was originally received: nor that it is under all circumstances entitled to recover in its own name from what may subsequently happen with respect thereto.

In this case, as already stated, there can be no recovery as to the 10 cars shipped to the Advance Elevator.

Two other cars were delivered to the defendant to be sent by it eastward, which were destroyed by the fire alluded to, the value of said cars being $602, $100 of the wrecked material having been received by the plaintiff. As to said two cars, the obligations of a common carrier existed, consequently the defendant is liable for the sum of $502, for which judgment is ordered.—*St. Louis Republican, Nov. 7.*

OLD AND NEW ROADS.

Baltimore & Ohio.—It is stated that this company has negotiated a new loan of $4,500,000 in 40-year 5 per cent. bonds, to be secured by mortgage on the Schuylkill River East Side road and branches in the city of Philadelphia. The proceeds are to be used for the completion of the road to Philadelphia and a New York connection.

Bangor & Piscataquis.—The Maine Central Co. has made an offer to the committee of the City Council of Bangor, Me., for the purchase of the city's interest in this road. The company offers to take the road for the amount of the city's bonded debt, which is $1,235,000, paying 5 per cent. interest thereon until the maturity of the bonds. The city is the chief owner of the road, holding much more than a controlling interest.

Boston & Maine.—This company has agreed to lease the Worcester, Nashua & Rochester road for 50 years, at a rental of $250,000 yearly, as noted more fully in another paragraph.

Buffalo, New York & Philadelphia.—The following is the statement for the quarter ending Sept 30, as submitted to the Railroad Commission:

	1885.	1884.	Inc. or Dec	P.c.
Gross earnings	$677,564	$694,301	D. $16,737	2.4
Operating expenses	483,325	446,306	I. 36,919	8.3
Net earnings	$194,239	$247,995	D. $53,756	21.7
Income from other sources	12,750	20,958	D. 8,208	39.1
Gross income	$206 989	$268,953	D. $61,964	23.0
Interest, taxes and rentals	200,075	253,601	D. 53,526	21.1
Surplus	$6,914	$15,352	D. $8,438	5.6

The general balance sheet shows cash on hand, $123,260; profit and loss deficiency, $38,305.

California Southern.—The last rail extension of this road was laid Nov. 9 in the Cajon Pass, completing the extension from San Bernardino to Waterman, 80 miles, and making the road 210 miles in length, from San Diego to Waterman. This line connects the Atlantic & Pacific with the port of San Diego, and gives that road and the Atchison, Topeka & Santa Fe an outlet on the Pacific coast, independent of any connecting line. The California Southern Co. has been for some time controlled by the Atchison, Topeka & Santa Fe, and it was through the interposition of that company that the money was raised to build this section and to put the road in repair.

Canadian Pacific.—The track of this road has been laid through to a junction with the Pacific Division for several weeks, as we have heretofore noted, but the last spike was not formally driven until Nov. 8. The ceremony took place at 9 o'clock on the morning of that day near Farwell, B.C., by the Hon. Donald Smith, of Montreal. General Manager Van Horne and other officers of the company and several invited guests were present, and the entire party continued on their journey to the Pacific coast, their special train being the first one which has run through.

Canada Southern.—Canada Southern second-mortgage 5 per cent. bonds to the amount of $1,750,000 are offered on the London market. The price of issue is set at 88. This is a part of the $6,000,000 issue, of which $3,432,000 are now outstanding.

Chicago, Burlington & Kansas City.—It is stated that surveys will shortly be begun for an extension of this road from Carrollton, Mo., southwest into the coal fields. Several towns are trying to secure this extension, and the inducements which may be offered by them will probably have some effect in deciding the line to be adopted.

Chicago, Burlington & Quincy.—This company's statement for September and the nine months to Sept. 30 is as follows:

	September— 1885.	1884.	Nine Months— 1885.	1884.
Earnings	$2 640,034	$2,707,110	$19,050,140	$18,505,825
Expenses	1,143,203	1,121,786	10,600,405	9,789,722
Net earnings	$1,496,831	$1,585,324	$8,449,735	$8,716,103

For the nine months the gross earnings increased $544,315 or 3.0 per cent., and the expenses $810,683, or 8.3 per cent., leaving a decrease of $266,368, or 3.1 per cent., in net earnings.

Chicago, Milwaukee & St. Paul.—It is stated that the $5,000,000 new preferred stock offered for subscription to the stockholders has all been taken. The company has applied to have the additional stock listed on the New York Stock Exchange.

Chicago, Rock Island & Pacific.—The grading of the new St. Joseph Branch of this road is now nearly completed from the junction with the Southwestern Division, at Winston, Mo., to St. Joseph. Track-laying was recently begun, and at last accounts the rails were down for 10 miles from Winston, with work progressing steadily.

Chicago, St. Paul, Minneapolis & Omaha.—This company having fulfilled the last condition required of it by the state of Wisconsin previous to the final transfer of the St. Croix land grant, by completing the 16-mile section between River Falls and Ellsworth, Gov. Rusk, Railroad Commissioner Haugen, and other state officers, last week formally inspected the new section before accepting it.

Dayton & Michigan.—Work is to be begun from a branch on this road at Peterson, O., to Piqua, 3½ miles. It is possible that this branch will be extended to Decatur, Ind., making a short cut or connection between the Dayton & Michigan and the Chicago & Atlantic road.

Delaware & Hudson Canal Co.—The following is this company's statement for its leased lines in New York for the quarter ending Sept. 30, as submitted to the Railroad Commission:

	1885. Albany & Susquehanna.	1884. Albany & Susquehanna.	1885. Rens. & Saratoga.	1884. Rens. & Saratoga.
Gross earnings	$660,273	$680,566	$707,588	$674,104
Expenses	391,165	409,944	364,255	308,485
Net earnings	$269,108	$270,622	$343,333	$365,619
Rentals	251,275	240,791	204,758	208,202
Surplus	$17,833	$23,831	$138,575	$137,327

The property of the company (canal, docks, etc.) in Kingston, N. Y., having been assessed on a valuation of $750,000, the company has appealed from the assessment, and the affidavit it presents as the ground upon which it asks for a reduction of taxation declares that while on the books of the company the value of the canal is carried as being $6,339,210, the fact is that if it had to be given in payment of a debt, it would be appraised at a sum far below that amount. The further declaration is made that if a railroad were built on the bed of the canal, coal could be transported to tide-water for 54 cents a ton, whereas boatmen are paid much more per ton for carrying the coal. The rate paid boatmen this year is 65 cents a ton. The affidavit says that "the canal is a burden to the company, and does not pay running expenses." This agrees with previous statements made by the company.

Denver, Marshall & Bolder.—This company has been organized by the parties who last spring bought the Denver, Western, & Pacific road at foreclosure sale. The new company has procured the right of way from Buffalo Hill, the old terminus of the line, to Bolder, a distance of 8

miles, and is making preparations to build that section. The road, which is completed from near Denver to Buffalo Hill, 20 miles, has not been operated for over a year.

Denver & Rio Grande Western.—President Palmer has issued a circular to bondholders in which he discusses at length the points at issue between the plan of the Denver & Rio Grande committee and the plan which he himself had already presented to the bondholders. He refers to the expense and delay involved in a foreclosure and refers to the advantages which his plan presents of an immediate settlement and the continued independence of the company.

East Tennessee, Virginia & Georgia.—The annual meeting was to be held in Knoxville, Tenn., Nov. 11, but the Secretary had failed to comply with the by-law which requires him to furnish at the annual meeting a complete list of stockholders, consequently no business could be transacted. No stockholder can vote until he has been a stockholder three months. The annual meeting was therefore adjourned to March 25, 1886.

A preliminary statement for the year ending June 30, shows as follows, in comparison with the previous year :

	1884-85.	1883-84.	Inc. or Dec.	P.c.
Gross earnings	$4,021,566	$4,173,263	D. $151,697	3.7
Expenses	2,733,223	2,563,338	I. 169,885	6.7
Net earnings	$1,288,343	$1,609,925	D. $321,582	19.9

During the year just closed, $346,425 was expended for construction, equipment and taxes, reducing the net result to $941,917.

Evansville & Indianapolis.—This company has been organized by the parties who purchased the Indianapolis & Evansville road at foreclosure sale last spring. The line extends from Evansville, Ind., to Washington, 57½ miles, and is to be extended from Washington to Terre Haute, 88 miles. The new company is controlled by the Evansville & Terre Haute.

Houston & Texas Central.—The statement of gross and net earnings, and surplus or deficit, for August and for eight months from Jan. 1 is as follows :

	August.		Eight months.	
	1885.	1884.	1885.	1884.
Gross earnings	$240,468	$193,878	$1,234,161	$1,425,185
Operating expenses	186,174	124,486	1,184,068	1,041,871
Net earnings	$54,294	$69,392	$50,093	$383,314
Other payments			62,910	508,017
Deficit			12,817	122,703

The other payments this year included $65,294 for interest on floating debt and $440,723 for renewals and betterments of road and equipment.

Illinois Central.—The Traffic Department reports gross earnings for October as follows :

	1885.	1884.	Inc. or Dec.	P.c.
Ill. and Southern Div	$1,082,735	$1,078,544	I. $4,191	0.4
Iowa lines	168,018	184,867	D. 16,849	9.1
Total	$1,250,753	$1,263,411	D. $12,658	1.0

The Illinois and Southern divisions include 1,664 miles of road; the Iowa lines 402 miles.

The Land Department reports sales of 824 acres for $3,813, and cash collections amounting to $5,963 for the month.

Jamestown & Buffalo.—This road has been organized to build a railroad from Jamestown, N. Y., to a connection with the Dunkirk, Allegheny Valley & Pittsburgh road near Falconer.

Lackawanna & Pittsburgh.—In Buffalo, N. Y., Nov. 7, the Court made an order directing the Receiver to turn over all of the rolling stock on the road to the Central Trust Co., of New York, within 30 days. The Receiver was also directed to furnish the court with a schedule of rentals due for the use of this equipment. No movement has been made toward resuming operations on this road, and the present order looks as though it was to be abandoned entirely, at least for the present.

Long Island.—The following is a comparative statement of gross earnings for the fiscal years ended Sept. 30 :

	1882-83.	1883-84.	1884-85.
Passengers	$1,695,177	$1,759,597	$1,807,346
Freight	718,743	720,630	727,623
Miscellaneous	271,170	276,005	291,069
Total	$2,685,090	$2,756,232	$2,826,038

The increase last year over 1883-84 was $69,806, or 2.5 per cent.; over 1882-83 it was $140,948, or 4.9 per cent.

Louisville, Evansville & St. Louis.—A meeting of the bondholders was held in Boston, Nov. 5, at which a number were present who did not approve of the plan of reorganization as submitted by the committee. The chief objection appeared to be the provision in the plan for the appointment of trustees to foreclose the mortgage and reorganize a new company, several of those present considering that the plan involved unnecessary delay, and that it would be much better for the bondholders to reorganize a new company directly. After much discussion a committee was appointed to confer with the old committee, investigate the whole matter and report to an adjourned meeting to be held one week later.

Manhattan.—For the month of October the gross earnings of this company, operating the elevated lines in New York, were $615,516, and the surplus after deducting interest, taxes and dividends was $19,133. The gross earnings in October, 1884, were $593,482, showing an increase this year of $22,034, or 3.7 per cent. The passengers carried in October this year were 9,407,252 ; last year, 8,929,653; increase, 477,599, or 5.3 per cent.

Manitoba & Northwestern.—The extension of this road from Minnedos, Man., to Birdtail Creek, 57½ miles, has been completed and accepted by the government of the Province. The company will receive a subsidy of $7,500 per mile for this line.

Midland, of Indiana.—This company has made an agreement by which its trains will run over the Louisville, New Albany & Chicago track between Westfield, Ind., and Indianapolis, 20 miles. Through trains will be run between Indianapolis and Anderson by this route.

Milwaukee & St. Louis.—It is stated that arrangements are being made to organize a company under this name for the purpose of building a railroad from Milwaukee to St. Louis on as near an air line as possible. The projectors have acquired possession of the old road-bed graded a number of years ago by the Beloit & Milwaukee road and propose to lay track on that road from Milwaukee to Delavan, Wis., as soon as possible.

Montreal, Portland & Boston.—The Court of Appeals at Montreal, in the case of Gilmour against the directors of this company, has made an order requiring a meeting of the stockholders to be held to elect a new board. In case the directors refuse to issue the necessary notice the Clerk of the court is directed to summon the meeting and to see that an election is held.

New England & Southwestern.—This company has been organized to build a railroad from a connection with the New York & New England road, east of the Hudson River, across that river to a point on the Newburg Branch of the Erie road. It is proposed to cross the Hudson by bridge at the Storm King Mountain. The company appears to be a reorganization of what has been known as the Highland Junction Co., and it is claimed that a considerable amount in subscription to the stock has been secured in Boston and other New England towns. It is stated that the Phœnixville Bridge Co. has agreed to take the contract for the bridge.

New Jersey Railroad Taxation.—Arguments on the railroad tax cases began before the Supreme Court at Trenton, N. J., Nov. 10. The argument was begun by ex-Gov. Bedle, who represents the Morris & Essex, the Warren, the Sussex, and the Passaic & Delaware companies. He raised 14 points on the question of the constitutionality of the act creating the State Board of Assessors and that of the legality of the method of carrying out the law if it is constitutional. He held first that the franchise tax against all the companies under the act is illegal and void, because franchises are ideal in their nature and there is no standard of value by which they may be estimated by themselves as property.

The Legislature attempted, ex-Gov. Bedle claimed, to delegate to the State Board the power to value the franchise without giving any measure or rule of valuation. Everything was left to the arbitrary will of the Board, and it had adopted two rules, each of which was an attempt to exercise legislative power. He held that the rules adopted by the Board were not based upon any principle of classification of the franchises, and also that under the constitutional amendment of 1875 the Legislature was prohibited from passing any special act conferring corporate powers, and was commanded to pass general laws under which corporations might be organized and corporate powers of every nature obtained. By reason of this there was no substantial value to the franchise. Under the act of April 10, 1884, the tangible property was to be valued separate from the franchises, one-half of 1 per cent. upon all the real and personal property (tangible) of the corporation for the state. This was an unjust and unequal discrimination against railroad property. The two systems of valuation for both local and state tax, one system by the State Board and the other by the ordinary local authorities, created a want of uniformity of rule in the assessment of the valuation of property. In New Jersey franchises had never been regarded as property, in any direct sense, for valuation and taxation, and the duty of determining the rules of their assessment was still in the Legislature.

Robert De Forest, representing the New Jersey Central, followed in nearly the same line of argument. The hearing was expected to continue for several days.

New York & New England.—The Governor and Council of Massachusetts have voted to sell the $1,842,000 in second-mortgage bonds of this company, now owned by the state, and have directed the Treasurer to advertise for proposals for their purchase.

In the suit of Orsamus Lamb against this company, Judge Devens granted an injunction restraining the issue of preferred stock to the floating debt creditors. The ground of complaint was that the statute which authorized the preferred stock did not in terms permit such a disposal of it. The Judge considered that, while no wrong was intended or apparent in the scheme for paying the debt with the stock without going through the form of making an exchange in cash or by check, yet it is a technical violation of the statute, and for that reason must be enjoined. Mr. W. C. Loring, solicitor for the company, asked for permission to be heard on the terms of the injunction, and at the Court's early convenience he will submit a modified programme of subscription and payment, which he hopes will be approved. A large number of the floating debt creditors stand ready to take the preferred stock as soon as permitted to, in payment of their claims.

New York, West Shore & Buffalo.—The application of the Receivers to the court for additional compensation came up again in Newburgh, Nov. 7. A number of affidavits were presented by the Receivers, giving the history of their connection with the road and recounting the difficulty encountered in getting any one to serve, the low financial standing of the road at that time, and the trouble experienced in running it, owing to the severe competition under which the business was conducted. The compensation fixed by the court was $40,000 for each of the Receivers, for about 19 months' service. The percentage which the Receivers asked for will, it is said, amount to about $750,000. Judge Brown, after hearing affidavits and arguments, said that he would not change the order already made, but that he was willing to send the matter to a receiver in order that testimony might be taken, and that the bondholders might have an opportunity to put in an answer. It is understood that the present proceedings are preliminary to an appeal from Judge Brown's decision to the General Term.

Northern Pacific.—Arrangements are being completed for extensive improvements in the terminal facilities at Duluth. It is proposed to build, in place of the present dock and warehouses there, a new dock 1,000 ft. long and 183 ft. wide. On this dock will be constructed warehouses for general merchandise and for goods in bond. These buildings are to be permanent structures, with capacity for a very large amount of merchandise. The track will be so laid that freight from the cars can be transferred either to the warehouses or to vessels alongside the dock with very little handling.

The section of 25 miles on the western end of the Cascade Division, which has been under construction for some time, is completed and will shortly be examined by the Government officials. This section extends from South Prairie, Wash. Ter., eastward, and makes 51 miles in operation on that end of the division, extending from Tacoma to the foothills of the Cascade Mountains. The only work remaining to be done is the ballasting, and when that is finished work on the western end of this division will be suspended for the present. On the eastern end of the Cascade Division work will continue from North Yakima westward. Nothing is known as to when work will be begun on the mountain section of this division.

This company's land sales for October were 27,056 acres, for $110,606. The number of acres sold in Minnesota and Dakota was 10,160; in Montana, 6,900; and in Washington, 9,996. The total sales for the four months from July 1 to Oct. 31 were 166,478, for $656,631. These figures do not include the large sales of Minnesota land negotiated during the month, as they are not entered upon the books of the company.

Surveys are being made for a branch line from Cheney, Wash. Ter., to Farmington. The branch, it is expected, will run from Cheney South to Rosalia, and thence southeast to Farmington, and will pass through a wheat country which is being rapidly settled.

It is said that the company will shortly award contracts for the construction of the Summit tunnel on the mountain section of the Cascade Division. This tunnel will be 1.9 miles long.

This company's engineers, it is stated, are now running a preliminary survey for a branch from Garrison, Mont., to the important mining town of Butte. Several lines are to be run, but it is thought that the one most likely to be adopted will run parallel and close to the Utah & Northern road. The line now occupied by that road was originally surveyed by the Northern Pacific Co.

Oregon Improvement Co.—This company's earnings for September and the ten months of its fiscal year from Dec. 1 to Sept. 30 were as follows :

	September.		Ten months	
	1885.	1884.	1885.	1884.
Earnings	$244,496	$289,578	$2,337,542	$2,776,794
Expenses	188,587	213,814	1,862,622	2,154,281
Net earnings	$55,909	$75,764	$474,920	$622,513

For the ten months the gross earnings decreased $439,252, or 16 per cent., and the net earnings $147,593, or 24 per cent. The statement covers all the operations of the company.

Oregon Railway & Navigation Co.—The board of directors at a recent meeting ordered the commencement of work on a branch to extend from the Palouse Division at Colfax, Wash. Ter., to Farmington, a distance of 30 miles. This branch will pass through a country already pretty well settled.

Philadelphia & Reading.—Ex-President Franklin B. Gowen has issued a circular to the stockholders, announcing himself as a candidate for the presidency of the company at the annual meeting in January next. Mr. Gowen complains that he has been harshly treated by the present management, and has been excluded from all voice, notwithstanding his long service as president and his large interest in the property, and charges that the present managers are doing nothing toward reorganizing or building up the company, but are simply allowing matters to drift and get into a worse position every day. Mr. Gowen concludes with the following statement of what he will do, if elected.

"I will not agree, at the request of the Pennsylvania Co., to exclude the Baltimore & Ohio Railroad Co. from the use of the Reading line in consideration of the Pennsylvania Railroad Co. either keeping the Baltimore & Ohio Co. out of New York or relieving the Reading Co. from the burden of transacting the business by offering the Baltimore & Ohio Railroad Co. an entrance to New York over its own line. I will never consent to relieve the Pennsylvania Railroad Co. from the useless and wasteful expenditure of capital in constructing their line to the anthracite coal fields, where they can get no business, by giving them out of the Reading Railroad Co.'s quota a larger coal tonnage than they could possibly obtain otherwise—in consideration of their agreement not to compete with the New York Central Co. for the New England business."

"Twelve hundred tons of steel rails have been purchased since the foreclosure, and are now being laid to replace the last 12 miles of iron rails which were on the road. Six hundred 25-ton gondola and 100 box cars have been ordered, and will be on the road within three months. Machinery which will give occupation to 75 men, will be ordered at once for the repair shops at Bradford. Three miles of additional side tracks have been laid in the Buffalo yards, which entitled the company to $60,000 consolidated bonds. These are now on hand.

"Of the $2,615,000 second-mortgage bonds outstanding, all but two have been paid according to the terms of the decree. These two will be paid on presentation to Mr. Adrian Iselin. The road having been bought for $1,100,000, there is a deficiency judgment of about $1,000,000 against the Rochester & Pittsburg Railroad Company."

The Receivers' cash account for September, as audited, was as follows :

	Railroad Co.	C. & I. Co.
Cash on hand, Sept. 1	$131,521	$63,817
Receipts	3,146,518	1,669,180
Total	$3,278,039	$1,732,997
Disbursements	2,941,947	1,731,547
Balance Oct. 1	$336,092	$1,450

The trustees' plan of reorganization is said to be as follows : The general mortgage bonds are to get for each $1,000 bond a new 5 per cent. bond for $750 and $250 in first preferred stock. Unpaid coupons are to be funded in new preferred stock. The 7 per cent. bonds are treated in the same way. Income bonds and convertible adjustment scrip are converted into first preferred stock, and 5 per cent. assessment will be repaid by first preferred stock. First series 5 per cent. consols are converted into preferred stock, and 10 per cent. assessment is paid, for which first preferred stock is given. Unpaid interest will be paid in second preferred stock. Second series 5s, debentures, scrip and debenture convertibles are made second preferred stock, and a 20 per cent. assessment is represented by first preferred stock. The stock will be assessed $10 per share and first preferred stock given for the assessment. Those who do not pay will be asked to surrender one-half of their stock. The assessment will yield $5,500,000, if two-thirds of the stock pays, which money will be devoted to pressing floating debt, and the balance of the debt will be funded in a collateral trust. The new first preferred stock will amount to $23,000,000, and the second preferred to $10,000,000. A reduction in rentals will be made, which, with the reduction in interest, is expected to bring the fixed charges within the probable net earnings. The plan does not seem to be well received.

Pittsburgh & Lake Erie.—Reports which have been circulated of a proposed transfer of this road to the Pennsylvania Co. are contradicted. These rumors had their origin in a conference between officers of the Pennsylvania road and those of the Pittsburgh & Lake Erie, which was held in Pittsburgh last week, but it is stated that this conference was simply held for the purpose of arranging some matters concerning coke traffic.

Rochester & Pittsburgh.—Mr. Adrian Iselin, who purchased the Rochester & Pittsburgh property at the recent foreclosure sale, has issued a circular to the stockholders.

The President of the company, Mr. Walston H. Brown, says, regarding Mr. Iselin's proposition :

"The financial condition of the new company is the following : The balance of the preferred stock not absorbed by the payment of the second-mortgage bonds and floating debt has been subscribed for at a price which provides for the payment of $197,610 of back coupons, which had not been paid, but had been bought, $77,000 of overdue car trust bonds, and $143,685, amount of all coupons maturing on and before Jan. 1, 1886, and leaves $500,000 of unpaid subscriptions subject to call on demand. There are no other matured liabilities on the road, the employés having been paid promptly each month, and all current operating expenses being fully covered by earnings due the company.

"The present fixed charges of the company, exclusive of taxes, are : $78,000, interest on $1,300,000 first mortgage bonds; $220,860, interest on $3,681,000 consolidated bonds; $49,770, interest on car trust bonds; $1,400, rental of Perry Railroad; $55,200, yearly rental to Erie Railroad; total, $405,230. In addition to this there is a liability to pay 6 per cent. on $478,000 income bonds, contingent on its being earned by the 108 miles from Rochester to Salamanca after providing for necessary improvements. These income bonds can be exchanged for the consolidated bonds, two of the

former for one of the latter. Whenever this exchange is made the fixed charges will be increased by $14,340, the interest on $239,000 consolidated bonds.

Scioto Valley.—A statement for the three months ending Sept. 30, shows gross earnings of $141,571; operating expenses, 104,159; net, 37,411. The fixed charges on all the bonds outstanding are as follows: On $1,294,000 firsts, $90,580 per annum; on $283,000 seconds, $19,810 per annum; on $553,000 consolidated, $36,710 per annum; or about $12,250 per month in all.

Shreveport & Houston.—The negotiations which have been pending between the bondholders of this road, which is the Louisiana end of the Houston, East & West Texas, and the Receiver of the road, have been finally settled by the bondholders agreeing to assume and pay all the floating debt incurred by the Receiver in completing the road. The bondholders will assume possession of the property as soon as the necessary legal formalities can be completed.

Sonora.—The earnings of this Mexican line, which is controlled by the Atchison, Topeka & Santa Fe, were, for the nine months to Sept. 30:

	1885.	1884.	Inc. or Dec.	P.c.
Earnings	$222,303	$161,876	I. $60,427	37.3
Expenses	182,996	196,975	D. 13,979	7.1
Net earnings	$39,307	$35,099*	I. $74,406	....

*Deficit.

These earnings are in Mexican currency. The September earnings this year were $24,708 gross, and $1,104 net, against gross earnings of $16,897 and a deficit of $6,404 in September of last year.

Toledo, Cincinnati & St. Louis.—Fuller reports of the hearing in the United States Circuit Court at Cincinnati, when the Toledo, Cincinnati & St. Louis was ordered to be sold, as noted last week, show that three cases were really involved, viz.: one by the holders of the terminal mortgage asking for foreclosure at Toledo, one by the main line mortgage bondholders on the portion of the road extending from Toledo to Kokomo, and the other by the holders of the mortgage bonds covering the road from Kokomo to East St. Louis. Two of the cases were within the jurisdiction of Judge Gresham, who sat with Judge Baxter.

Judge Baxter held that the report of Special Master Cox was in error, and set it aside, at the same time vacating the order of reference to him. A decree of foreclosure and sale of the property was ordered. Judge Baxter said that the parties could litigate the questions at issue after the sale of the property, that the road was not earning expenses, and that the Court did not propose to have the sale delayed for perhaps a year or so longer on account of these differences.

A dispatch from Indianapolis, Nov. 6, says: "In the United States Court Judges Gresham and Wood decided that the mortgages of the Central Trust Co., E. F. Leonard and G. D. Braman, of New York, on the Toledo, Cincinnati & St. Louis Railroad should be extended over the Frankfort & State Line and the Frankfort, Toledo & St. Louis divisions, and that the whole property should be sold under this mortgage. An appeal has been taken and a supersedeas bond, in the sum of $800,000, filed, which will have the effect of continuing the road in the hands of the Receiver until the United States Supreme Court can pass on the case."

By the terms of the decree of sale as entered, General McNulta, the Receiver, and W. P. Fishback, Master in Chancery, are to make the sale at Indianapolis after 30 days' notice by advertisement. Both divisions are to be sold at the same time and place, the minimum price fixed being $900,000 for the western end and $600,000 for the eastern end. On the latter $35,000 and on the former $50,000 is to be paid in cash at the time of the sale. The Receiver's debts, amounting to over $800,000, and the court costs are to be paid first out of the proceeds of the sale.

Tulare Valley & Giant Forest.—This company has been incorporated to build a railroad from a junction with the Southern Pacific in Tulare County, Cal., northeast to a point at the foot of the Sierra Nevada mountains, a distance of about 50 miles. The line is intended to reach the big tree region, which is so much visited by tourists.

Union Pacific.—The land sales for October were 178,315 acres, for $198,478. For the ten months to Oct. 31, the land sales were: Union Division, 620,827; Kansas Division, 609,333. Total, 1,230,160 acres, for $3,531,010, showing a decrease of 55 per cent. from last year in the amount of sales.

Wabash, St. Louis & Pacific.—The Wabash reorganization committee gives notice that the time during which bonds may be deposited under the agreement or reorganization has been extended to Nov. 16; after that date an extra payment of 2 per cent on all bonds deposited will be required. The committee states that the holders of $13,000,000 bonds have signed the agreement.

Wichita & Colorado.—Work is shortly to be begun on this road, which is to be a branch or extension of the St. Louis, Fort Scott & Wichita road from Wichita, Kan., through the Arkansas Valley to Larned. The road has received votes of local aid to the amount of nearly $4,000 per mile. To earn these subsidies at least 25 miles must be finished by Feb. 1 next.

Wisconsin Central.—As noted last week, the Chicago & Western Indiana Co. had declined the application of the Wisconsin Central for entrance into Chicago over its track. The application was refused on the ground that the addition of the Wisconsin Central business would seriously interfere with the handling of Chicago freight over the Belt Line, which the Central proposed to use, and that under present circumstances the Western Indiana Co. was not prepared to accommodate the additional business offered without incurring a much greater expense than the terms offered would warrant.

The work of grading the line from Schleisingerville to Chicago is progressing rapidly and tracklaying was to be begun this week, and it is expected that there will be no delay or interference with tracklayers until the outskirts of Chicago are reached. The completion of the road into the city will, of course, depend upon what arrangements are made hereafter for its entrance. The distance from Schleisingerville to Chicago is 122 miles.

Worcester, Nashua & Rochester.—It is now admitted that an agreement has been concluded for the use of this road to the Boston & Maine Co., at a rental of $250,000 yearly. The lease is to take effect Jan. 1, provided, of course, that it is approved by the stockholders of both companies, and is for 50 years. Of its approval there seems to be little doubt, as it is understood to have the backing of most of the heavy stockholders of the Boston & Maine, and as it is extremely advantageous to the stockholders of the lessor company.

The Worcester, Nashua & Rochester road is 94½ miles long, extending from Worcester, Mass., to Rochester, N. H. It has $3,099,800 capital stock and a funded debt of $1,662,000 in 5 per cent. bonds. The rental will thus be sufficient to pay 5½ per cent. on the stock, which for several years has received only 3 per cent. The gross earnings of the road last year were $639,447 and the net earnings $181,421, or about $68,500 less than the rental now agreed upon. It is claimed, however, that by saving and management, and by the additional traffic which the lessee will be able to throw over the road, that it can be made to earn the full amount of the rental, and that it will not be a burden upon the lessee. The road connects at Rochester with the Portland & Rochester, which is already controlled in the interest of the Boston & Maine, so that the company will control the line from Portland to Worcester, where it has plenty of connections both for Western and New York business. The operation of this line will not, of course, benefit directly the Boston & Maine and its leased Eastern road, but the ownership of this line from Portland to Worcester will prevent its lease by another and possibly a hostile company, and will enable the lessee to prevent any injurious competition on business to and from Portland. Doubtless, it was this, and not any direct advantage expected, which was the principal motive for the lease. As these roads do not connect within the state of Massachusetts, there is a question whether the lease can be made without special legislative authority. Possibly there will be some opposition in the Legislature, but the influence of both corporations is likely to succeed where there seems to be no question to arouse popular opposition.

The Worcester, Nashua & Rochester is, in part at least, an old road, having been built from Worcester to Nashua a number of years ago. The extension to Rochester was built about ten years ago, being then leased and subsequently consolidated with the original line. The extension was not profitable and the company which had for a number of years paid large dividends was compelled to pass them for a time and to make an arrangement for the reduction of interest on its bonds. Subsequently the payment of dividends was resumed, but they have never exceeded 3 per cent. since that time. About a year ago the management, which had controlled the road for a number of years, was voted out and an entirely new board elected, and it then appeared that a large interest in the stock had been bought by parties whose names were not then known, but who, it has been ascertained, were Mr. Frank Jones, of Portsmouth, N. H., a prominent director of the Eastern road, and other parties, who are largely interested in both the Eastern and the Boston & Maine. It has been reported that the Boston & Lowell Co. was anxious to lease the road, but the officers of that company deny the statement, saying that they had no such intention. The profits on the stock operation have been very large, as it has been more than double in price.

ANNUAL REPORTS.

The following is an index to the annual reports which have been reviewed in previous numbers of the current volume of the *Railroad Gazette*:

Evansville & Terre Haute.

This company owns and works a line from Evansville, Ind., north to Terre Haute, 109 miles, with a branch from Owensville Junction to Mt. Vernon, 37 miles, making 146 miles operated. It also owns a branch from Terre Haute to Rockville, 23 miles, which it does not work, but leases to the Terre Haute & Logansport Co. The report is for the year ending Aug. 31.

The company also controls the Evansville & Indianapolis road, from Evansville to Washington, 57½ miles. It operates that line, but its earnings are not included in the report, which covers only the 146 miles noted above.

The general account, condensed, is as follows:

Stock		$2,999,938
Bonds		4,257,000
Bills payable		87,304
All other accounts		138,991
Income account		590,669
Total		$8,073,902
Road, etc	$6,268,676	
Stocks and bonds owned, cost	240,265	
Bills and accounts receivable	169,323	
Materials, fuel, etc	51,853	
Cash on hand	57,819	
Bonds on hand	1,027,000	
Extension account	239,369	
Miscellaneous items	19,596	
		8,073,902

The funded debt includes $882,000 divisional first-mortgage bonds, $375,000 Mt. Vernon Branch bonds and $3,000,000 consolidated bonds. Of these $852,000 consols and $175,000 Mt. Vernon Branch bonds are held in the company's treasury.

The earnings for the year were:

	1884-85.	1883-84	Inc. or Dec.	P.c.
Freight	$408,742	$431,718	D. $22,976	5.3
Passengers	192,150	206,823	D. 14,673	7.1
Mail, etc	117,931	114,563	I. 3,365	2.9
Total	$718,823	$753,105	D. $34,284	4.6
Expenses	361,225	365,810	D. 4,587	1.3
Net earnings	$357,600	$387,297	D. $29 697	7.7
Gross earn. per mile	4 923	5,158	D. 235	4.6
Net " "	2,449	2,653	D. 204	7 7
Per cent. of exp	50.3	48.4	I. 1.9	....

The loss in earnings was due partly to short crops on the line, and partly to low rates resulting from competition.

The result of the year was as follows:

Net earnings, as above		$357,600
Interest on bonds	$202 320	
Dividends, 2 per cent	60,000	
		262,320
Balance, surplus for the year		$95,280
Surplus, Sept. 1, 1884		495,329
Surplus, Aug. 31, 1885		$590,609

President Mackay's report says: "The loss of gross business, the figures indicate, was experienced in July and August. These months heretofore have given the company much business in the movement of wheat, while this year we did not move a car-load during this same time. We have a good crop on our line, which will be moved during the fall, and our fall months will gain what we lost in the summer months.

"Since the last report the completion of the great and magnificent bridge spanning the Ohio, and connecting the rails of this company with the Louisville & Nashville road, has occured. The bridge was opened in July for business, and we expect therefrom a large increase of traffic, both freight and passenger.

"In building the Evansville & Indianapolis Railroad, and in guaranteeing its bonds, this company secured the stock franchises and $292,000 of its bonds. The net cost of same to this company will not be fully determined until final report of the Indianapolis & Evansville receiver is made, which will be some time during the coming year, and when made will cause some increase of the item of 'Evansville & Indianapolis securities,' as now appears in the general account.

"With the beginning of the calendar year your directors felt that the company could pay small quarterly dividends, and so ordered. The first one of 1 per cent was paid April 1 and has been so repeated quarterly, which we feel capable of continuing, maintaining at the same time the high standard of the road's physical condition."

Manhattan.

This company owns and operates the elevated railroads in the city of New York, including lines on Second, Third, Sixth and Ninth avenues, 32 miles in all. The figures below are from the statements presented at the annual meeting this week, for the year ending Sept. 30.

The passengers carried last year were as follows:

	Number.	P. c. of total.
Second Avenue line	13,834,750	13.4
Third " "	48,399,496	46.8
Sixth " "	30,704,078	29.7
Ninth " "	10,416,405	10.1
Total	103,354,729	100.0
Total, 1883-84	96,502,720	....

The increase last year was 6,652,109, or 6.8 per cent. The average fare received last year was 6.77 cents. The rates of fare are 5 cents in commission hours (5:30 to 8:30 a. m., and 4:30 to 7:30 p. m.), and on Sundays, and 10 cents at other times. The average fare indicates that very nearly two-thirds of the passengers must have been carried at the 5-cent fare.

From the first opening of the Ninth avenue line (3½ miles) in 1872, there have been carried in all 577,820,287 passengers. From the completion of the present system in 1879, six full years, 514,960,856 passengers have been carried.

The earnings for the year were:

	1884-85.	1883-84.	Inc. or Dec.	P.c.
Earnings	$7,060,567	$6,726,359	I. $274,208	4.1
Expenses	3,967,984	3,884,949	I. 83 035	2.1
Net earnings	$3,032,583	$2,841,410	I. $191.173	6.7
Gross earn. per mile	218,768	210,199	I. 8,569	4.1
Net earn. per mile	94,768	88,794	I. 5,974	6.7
Per cent. of exp	56.6	57.7	D. 1 1	....

The traffic is entirely in passengers, no freight being carried, and the receipts from mails and miscellaneous sources are less than 1½ per cent. of the total earnings.

The result of the year was as follows:

Net earnings, as above		$3,032,583
Interest, etc	$1,459,044	
Dividends, 6 per cent	1,560,000	
		3,019,044
Surplus for the year		$13,539

The report says of last year's operations: "The introduction of 5 cents fare on Sundays reduced the gross receipts for the year ending Sept. 30, 1885, over $100,000.

"The daily average number of passengers carried during the year ending Sept. 30, 1885, was 283,164.

"The greatest number of passengers carried during any one day was 400,076, and these were carried without the slightest accident to any one and without extra precautions on the part of the management.

"The capacity of the road has never been fully tested, but we are of the opinion that we can carry, with safety, at least 500,000 per diem with our present facilities.

"Since the opening of the roads only one person has lost his life after being on board the cars, and that was due to his own carelessness. This fact has not its equal in the world's history of railroading."